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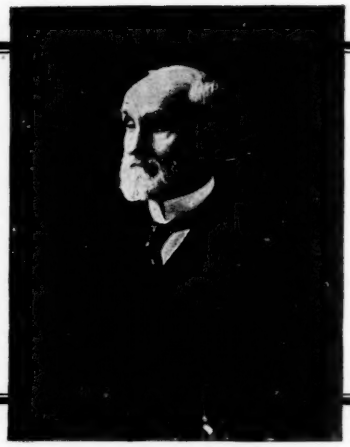

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Original Communications

IMPORTANCE OF EARLY DIAGNOSIS OF ACUTE ABDOMNIAL PAIN.*

By JOSEPH D. ROGERS, M. D., Washmgton, D. C.

I wish to note a few thoughts which may cause us to attach more importance to the subject of early diagnosis of acute abdominal pain.

The physician, or surgeon, when called in to see a patient with acute pain, is often confronted with a most serious condition which does not admit of watchful waiting. A proper valuation must be promptly placed upon the symptoms presenting. The high mortality still found in acute abdominal conditions is due, both to some of us being too conservative and hesitating to use radical measures when warranted, vainly hoping that the alarming symptoms may take a favorable turn; or hurriedly performing operations before case has been thoroughly studied. A prompt decision must be reached. In some cases a delay is as harmful as a hasty operation, and all of us recognize the perniciousness of hasty operations. A diagnosis should be made as accurate as circumstances will permit and at least to the extent, first, of determining whether or not an operation is indicated; next, when operation should be performed; and last, whether we can safely give the patient opiates to relieve pain while observing case.

Many times it will be found difficult to differentiate acute abdominal pain when all methods of diagnosis are exhausted, but I believe that many more cases would be diagnosed properly if careful attention and methods available were used. We cannot hope to have all the facilities for studying cases at all times, but we can always obtain a careful history, which should be taken by the attending physician; make a careful survey of symptoms which should usually include chest, abdominal, rectal and vaginal examinations, with study of blood and urine, and such special tests as are indicated and available. In the ancient days, great dependence was necessarily placed on those things apparent to the naked eye; that is, the appearance of the patient and the obvious variations from the normal produced by the various phenomena of disease. This is equally as valuable now as then. Keen observation of cases will do much to improve our diagnosis, and many men, no matter how isolated, have developed this power of observation to a wonderful degree.

Diagnosis is, or should be the sum total of the history, the findings in the patient, and the results of various specialized methods of examination, and I wish to emphasize that it is not the examinations, or tests, that count but their interpretation and assigning to them their proper value and significance.

The recent impetus to group study of cases is a most notable advance in diagnosis and should be of incalculable benefit to both patient and physician. It is giving specialized medicine to the smaller communities as well as the larger centers. The combination of talent should bear the same relation to medicine as capital to industry and should be used, not for increased profit, but for increased efficiency. Also, we must be careful not to develop the habit known as "passing the buck" and no individual assuming the responsibility. There are disadvantages in the group system, and one patient expressed one phase of it very aptly when, after he had been quite thoroughly examined by a group of young men and told an operation was indicated, was asked what he intended to do about having the operation performed; he replied by saying he "reckoned he would go and ask his old family physician about it, as he—the family physician—knew his constitution best." Group medicine should be of vast economic value by conserving time

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

and accrued accomplishments and should materially lessen commercialism. However, we must guard against making unnecessary examinations at the patient's expense, in time, pain, danger or cash expenditure. Also, we must be careful in group medicine to have men capable of making and interpreting special tests undertaken. Some groups are composed of four or five general practitioners who meet for an hour or two at their building and masquerade as specialists a few hours daily, attempting examinations and interpretations which they are not duly qualified to make. Proper group work will tend to increase the number of men with special knowledge and make better specialists, for the man worthy of that title will have to prove his ability. There is a sort of feeling that no physician has reached the full stature of medical life who is not in some way a specialist, and yet someone has said that a specialist is a localized hypertrophy. The best specialty of all is the specialty of general diagnosis. I cannot conceive of anything more noble or gratifying in medicine than to be recognized as a careful and keen observer, intelligent and wise diagnostician with good judgment, and a safe counsellor.

Perforation of gastric ulcers, typhoid perforations, acute hemorrhagic pancreatitis, ovarian cysts with twisted pedicles, strangulated hernias, acute obstruction of bowels require immediate diagnosis and prompt operation. Operations for adhesions should be considered most carefully, for we must remember the possibilities of breaking up one adhesion and having two new ones form, which often do more harm than original ones. Any patient who has previously had an abdominal operation and subsequently has abdominal pain, with difficulty in getting bowels to move or expel flatus, should be suspected of having an adhesive band obstructing bowel. I have seen some cases in which it acted as a string tied around a bag. In children, special care should be taken to eliminate pneumonia and diaphragmatic pleurisy, which often gives abdominal pain and rigidity. In neurotic cases, abdominal pain is often of a cyclic character and the relief afforded by operation is not a cure, but an interval in the cycle. A careful investigation by a competent neurologist would often save us the ignominy of an unnecessary operation which often entails a train of symptoms which are worse than those for which it was undertaken.

In this age, when machinery is so extensively used and especially automobiles, we must recognize the importance of acute abdominal conditions caused by trauma, such as ruptured spleen, liver, kidneys and intestines. We must be careful not to minimize the seriousness of the presenting symptoms, regardless of the fact that the injury has, apparently, been trivial. In cases of suspected hemorrhage into abdominal cavity, the use of an aspirating syringe is both safe and often enlightening. A short time ago I saw a boy of eighteen years who upset his automobile by turning off the road at night in passing another automobile and remembered nothing of having been struck in fall. On admission to hospital, he had a pulse of 80, normal temperature, and no evidence of shock or sign of trauma on external examination. He complained of intense abdominal pain and was rigid over right side of abdomen. Leucocyte count was 16,000. Catheterization of bladder disclosed bloody urine, and a subsequent operation revealed a ruptured kidney. His companion, sitting beside him the entire time, was unhurt.

Unfortunately, many abdominal cases are not seen by any physician until late in the disease. I think we should give the laity rational information regarding the seriousness of acute abdominal pain, but we must be extremely careful not to unduly alarm.

This past summer I saw a boy who had a Meckel's diverticulum coming off from ileum about one foot from the caecum, which had looped across and cut off circulation in about one and one-half foot of colon and ileum, causing gangrene. He had been allowed to remain for thirty-six hours without medical aid. Patient was brought into hospital moribund six hours after physician first saw the case. The case at its onset could have been most easily relieved by severing the small adhesion of the diverticulum. Just here I would like to say we seldom see an adult who complains of chronic dyspepsia and who is continually dosing himself to obtain relief after eating, who is not in reality a surgical patient and his trouble is usually in appendix, gall bladder, stomach or duodenum and may take on an acute phase at any time. Often the life and future happiness of a patient are in the hands of the physician who first sees the patient and

the importance of early diagnosis of acute abdominal pain is paramount. Many patients with acute abdominal disease unfortunately do not fall into the hands of a competent physician or surgeon until immediate operation under the unfavorable condition of peritonitis gives the only chance of life. Then, again, for another class of cases postponed operation and preparatory treatment by accepted methods converts a desperate risk into a favorable one. To differentiate these cases and to decide when to operate, taxes a surgeon's judgment to the utmost and experience is the best teacher. When in doubt, wait. We frequently find old adhesions about the appendix, walled-off collections of pus or blood which have gravitated to the pelvis, and omentum repairing perforations of stomach or bowels and other conditions which indicate the wisdom of deferring certain operations: they show us that we cannot say a patient will surely die unless operated.

Abdominal operations should have definite indications and, when performed, enough should be done to give a reasonable assurance of a cure. Surgical tinkering with the ovaries, tubes and intestines is often a failure and is followed by conditions requiring subsequent operations which could have been avoided, had more careful pre-operative study been given the patient. The character of abdominal operation done should be determined by the individual requirement as well as the pathology present. To illustrate, a young woman with multiple myoma should have a myomectomy, while one near the menopause should have a hysterectomy.

It is important to differentiate pelvic infection, for we have advanced to the point where the treatment of acute puerperal infections is chiefly expectant and surgery resorted to only to clean up the debris. Especially is this true of acute puerperal infections and the greatest danger to life in acute puerperal infection is the over-anxious, meddlesome surgeon.

In non-operative treatment of acute pelvic infection, we have added much of value to the important subject of acquired immunity. These principles of treatment are now being applied to acute chest infection. I believe that within a few years the pleural cavity will be invaded with as much impunity as the abdominal cavity now is. More attention should be paid to the urinary tract, for many cases of pyelitis and focal infection of genito-urinary tract resemble closely abdominal lesions and often have harmful abdominal operations been performed. Renal stones often give misleading symptoms. It has been estimated that nearly fifty per cent. of patients with stones in ureters have had a previous abdominal operation which did not benefit and many times added to the burden of the kidneys. Accurate study of urine, microscopically, by showing the presence of blood and pus cells, will often help us to discover that the pathology is in the urinary tract. The cystoscope is a valuable aid and should be used more frequently in diagnosis.

Any surgeon who has had a large experience in abdominal surgery can recall errors he has made in operating on patients with typhoid fever, pneumonia, pregnancy, pyelitis, locomotor ataxia, or other diseases mistaken for abdominal lesions. These mistakes, while regrettable, are pardonable if we have used all the means at our command to make a proper diagnosis. These mistakes show us that even under the most favorable circumstances, we often err. That there may be better co-operation between physician and surgeon I would suggest that the physician who sees the case at the onset explain to the patient and friends the difficulty of determining the significance of acute abdominal pain at the beginning and that there are certain stages in some acute abdominal conditions which cannot be safely operated until infection has become less virulent and localized. They should not tell the patients that they are being sent to a hospital for immediate operation, but rather that they are being sent to hospital that more facts may be found out and the findings better correlated so that the question of operation may be determined. It is very embarrassing to the surgeon to have to decline to operate in cases of acute pelvic inflammatory disease when patients have been rushed to hospital for immediate operation.

If all cases of acute perforation were operated in the first twelve hours the mortality would be less than one per cent. One operator reports fifty-two cases of perforating gastric and duodenal ulcers on which he did an early gastroenterotomy at the primary operation with only one death. One writer states that thirty per cent. of the cases of diffuse peritonitis seen after the first day die. The mortality from acute appendicitis, if statistics from all hospitals, large and small together, with

those treated at home are considered, will be found to be ten per cent. Some surgeons who get their cases of appendicitis exceptionally early, report series of two or three hundred cases with less than one per cent. mortality. Few cases of acute appendicitis operated on within twelve hours of onset would prove fatal.

Purgatives will be mentioned in order to condemn. The old adage, "keep the bowels open and trust to Providence," has no place in the treatment of acute abdominal conditions. Purgation is responsible for many deaths in acute infections of abdomen. Personally, I have never seen a ruptured appendix where the patient had not been previously purged. This observation is confirmed by many others of larger experience than mine. Do not purge unless you can exclude certain acute abdominal conditions.

Finally, I would like to emphasize the great danger of opiates in acute abdominal pain, except in suitable cases, as well as the benefits opiates may be when properly used in certain cases in which we have decided to try to tide over the acute symptoms of the disease and postpone surgical intervention until a more favorable time. The patient is most interested in the relief of pain and is entitled to a skilful diagnosis, for there are many times when we can safely give opiates in cases of pelvic inflammation, gall bladder disease, stones in kidney or ureter, etc., whereas, a physician not skilful in diagnosis forces his patient to suffer much unnecessary pain.

In conclusion, I would say that by more thorough examination, more accurate observation, more careful analysis and selection of cases, profiting by our mistakes and endeavoring to make earlier diagnosis in all our acute abdominal conditions, we may be able to save one more abdominal case out of a hundred and that, to the fortunate individual, means one hundred per cent. improvement.

1400 *M Street, Northwest.*

DISCUSSION.

DR. STUART MCGUIRE, Richmond: The position taken by Dr. Rogers in his paper is so commendable that all I can do is to emphasize some of the points he has made.

The necessity for early diagnosis and prompt operation in acute abdominal conditions is shown in the mortality that still exists in a disease as common and as well-known as appendicitis. There are certain surgeons working under favorable conditions who are able to report long series of consecutive cases with a mortality of one per cent. or two per cent., but this by no means represents the work of the rank and file of the profession.

Not so long ago I read the statement of a reliable authority who said he had recently tabulated the mortality rate of appendicitis as given in all available reports of hospitals in the United States. The figures showed the death rate was over ten per cent. As hospitals that publish reports are as a rule superior to those which do not do so, and as these statistics include chronic as well as acute cases, the present mortality of acute appendicitis in this country is something appalling. It is a recognized fact that if cases of appendicitis are operated on earlier, practically all of them will recover; hence the high mortality is a reproach to the profession.

When an acute case comes to me, I have a physical examination made of the heart and lungs and a laboratory examination of the urine and blood. I do not delay operations for a thorough and complete study of the case. If you call into consultation the urologist, neurologist, roentgenologist, gastroenterologist and other specialists, the patient will die or get in a hopeless condition before a final conclusion is reached. I must confess that in following this practice I have sometimes made a mistake, but an early operation does no harm and frequently saves life. There are, of course, some cases brought to a surgeon when it is "too late for an early operation and too early for a late operation," and in these cases it is often wise to practice "watchful waiting" and try to get the patient in better condition before opening the abdomen.

DR. W. L. PEPLE, Richmond: I enjoyed Dr. Rogers' paper very much. There are several points, however, about the importance of early diagnosis in acute abdominal pain, that he did not emphasize.

In the first place, the acuteness of the pain, after all, depends largely on the mentality and temperament of the sufferer. The longer you live, the more clearly you realize this fact. What is a horrible pain to one patient is really nothing at all to another. So you really have to know something of the person you are trying to help.

Then comes the relation of abdominal pain to other conditions. That is where the surgeon comes in: to link up the abdominal pain by putting it in the proper relation with the other symptoms. Abdominal pain alone may have very little significance. Abdominal pain, when stomach and colon are empty, is of very great significance. Pain with rigidity may be entirely different. It may point to a case of appendicitis. I know of no more alarming a symptom. Where the pain continues, without ceasing, we know something serious is going on. Frequently, when the pain stops suddenly, and there is only tenderness, we know that we have something very serious to deal with. It is usually a gangrenous appendix.

SOME PEDIATRIC PRACTICALITIES.*

By SAM WILSON, M. D., Lynchburg, Va.

By request, I have listed herein some practical observations I have made in the practice of pediatrics, during the past decade.

Firstly, and I might add foremostly, I have been impressed with the fact that a large number of children are wrongly consigned to the tubercular doom. I see these cases come into

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

my office so diagnosed, and I see them yield to anti-syphilitic treatment. Our observation leads us to believe that pulmonary syphilis is a very common thing in late infancy and childhood.

Dr. Cabot of Boston says, in his work on physical diagnosis, that every case with a chronic cough, diagnosed as tuberculosis, in which no tubercle bacilli could be demonstrated, should be given the benefit of specific therapy.

We know that specific invasion of the mucous membrane of the respiratory tract is a commonplace thing in hereditary syphilis, yielding the symptom complex, chronic cough, anaemia, wasting, and so forth, on which the diagnosis of tuberculosis is often predicated. To make the exigency more confusing, the stethoscopic findings, in the two divergent conditions are substantially analogous.

After years of careful study and scrutiny we are unable today to differentiate stethoscopically the two morbid states.

Yester-year the English wrote a great deal about what they denominated the syphilo-tubercular. Unquestionably the two conditions are not infrequently coincidental. The possible associative relationship between these two diseases is intensely absorbing.

The English have been making some superlative claims for the iodides in the treatment of tuberculosis. It is certainly not inconceivable that the good result reported from the iodine treatment was referable, not to the action of iodine or the tubercular process, but rather to its specificity on the syphilitic virus and its attendant pathology.

When nature is encumbered by a species of infection like syphilis, and has super-added an infection like tuberculosis, manifestly, nature's immunity producing mechanism can work to better advantage when she is dis-encumbered of one or the other. It is very probable that in this way is produced the favorable results observed by the English; syphilis being a devitalizer of nature's anti-bacterial mechanism prevents a return to normalcy in these cases, rather than a superlative degree of tubercular infection.

We should not diagnose a case of tubercular meningitis too soon. We have seen cases so diagnosed prove to be nothing but cyclic vomiting. The simple procedure of tapping the spinal cord will save us much embarrassment. In every case of severe acute abdominal pain in an infant we should think at once of an over distended bladder and intussusception. We should never, if called over the phone at night, prescribe paregoric for a child suffering from an acute abdominal pain. Two cases, in the past year, coming under our observation, were so treated by the family physician. They were cases of intussusception. Its a sad commentary, but it is a fact, that this is too often a mispractice, the sequel of which is a tragic catastrophe. If we are guilty hereof, Nemesis should hover over our couch as the most horrible nightmare that ever came to plague a human thought.

We should never think of rheumatism as extant in an infant. Such will almost invariably prove to be either syphilitic epiphysitis or scurvy.

We are prepared to admit that the process of teething does cause trouble and does cause pain. We have observed that the best way to tranquillize an irritable, fretful, teething child is to instil a few drops of a ten per cent. solution of carbolic acid in the ear. Pain in the ear is a very common concomitant of teething. A vermilion hue of the drum membrane is very often seen in those cases in which the tooth is exerting great pressure and about to erupt through the mucous membrane. At times these children are very restless and fretful without any apparent discoverable cause save pressure on the gums. This is the type of case that is benefited by instillations in the ear. The explanation of this phenomenon is found probably, in the fact that the inferior dental nerve sends a tributary to the tympanum. When the tooth is exerting great pressure, the irritability of the inferior dental nerve is carried along to its tributary supplying the drum membrane. This irritation produces the resultant redness and lancinating pain. Of course, we can accept or spurn, as the mood may please, this explanation as enunciated by Dr. Rotch, but the practicality remains that not even the magic wand of Prospero could effect a more remarkable change than that which is often seen in these cases by carrying out the suggestion of Dr. Rotch, namely, the instillation into the ear of a ten per cent. solution of phenol.

Many difficult feeding cases are predicated

upon a syphilitic basis. It is not uncommon in these cases to get a history of jaundice that persists from three to eight weeks after birth. Dr. Holt says that every case of jaundice that persists after three or four weeks is strong presumptive evidence of syphilis. Putting these cases, with such a history, on inunctions of mercury seems to increase the child's digestive capacity and facilitates the problem of feeding.

Called to a case of convulsions, we should remember the possibility of a foreign body in the ear. We once saw a case clear up instantly on the removal from the auditory canal of a small navy bean.

We should remember that rapid respiration does not necessarily indicate disease of the lungs. It is very often a herald of an impending acidosis. If we do not take cognizance of this prognostic a fatal issue may ensue. Given a case then with hyperpnoea, with no physical signs in the chest, we should think at once of acute acidosis and start the alkalies and the pulmonary congestion will often be fugacious.

We should remember never to give either camphor, antipyrine, belladonna or the salines to a nursing mother unless we want to dry up the milk.

If we are in doubt as to the exact nature of an acute respiratory disease, the best thing to give is camphor. From 1 to 3 drops of the Spirits of Camphor every 3 hours apparently benefits these cases to no diminutive degree.

If mother's milk is scanty, the best galactagogue we have found in the realm of pharmaceuticals is Nutrolactis. Nutrolactis either singly or conjointly with Neoferrum often has a very happy effect.

In all very nervous children we should be certain to think of intestinal parasites. We should examine the stools carefully for the ova; we have seen children as young as nine months vomit the ascaris.

We should not be too confident that we can diagnose diphtheritic laryngitis from pneumonia following an attack of catarrhal laryngitis. The distinguishing earmarks of these two diseases are made very clear in text-books, but in actual practice the characteristics are often not sufficinently marked to be of diagnostic value. The safest thing to do is to give antitoxin.

Text book annotators would spurn the idea that asthma could be confused with diphtheria, yet in 1920 we saw two cases, one with a fatal termination, diagnosed as asthma, which in reality, were cases of diphtheria.

We have been struck with the fact that the type of breathing in laryngeal diphtheria, so far as the chest signs are concerned, smacks decidedly of the asthmatic. If we listen to the chest of a child, particularly one past three or four years of life, and note an asthmatic type of breathing, we take great pains to make a careful scrutiny of the nose, mouth and pharynx. If we don't do this in the vernacular of the street, some of these cases will get by us, provoking a tragedy.

One of the cases I have alluded to had been seen by two physicians, each in turn pronouncing the morbidity asthma.

In an infant, of course with its small larynx and progressive laryngeal stridor, this misdiagnosis is not likely to be made, but in the run-about age, requiring several days, as it does, to produce stenosis to give us the text book picture of laryngeal diphtheria, this misapprehension does occur.

We would sound a note of warning to those who palpate the post-nasal space without proper precautionary disinfection of the hands. Thorough surgical antisepsis of the operator's hands should be practicalized before attempting post-nasal palpation. If we don't do this, we may set up a severe post-nasal infection. Dr. Talbot, of Boston, once told me that he considered postnasal palpation in infants a major operation in point of precautionary asepsis.

Given a case running an inexplicable temperature for several days, particularly if the mother states that the child has a head cold or snuffles, we should think at once of acute adenoiditis.

We have seen the temperature in such cases, defying elucidation, defervesce promptly on instilling in the nose a ten per cent. solution of argyrol.

Given the following, an infant, a girl, with fever and digestive disturbances. If the mother on interrogation, replies in the affirimative that the diapers are stained yellow, and that it seems to hurt the child to bend her back, as evidenced by crying, when the diaper is adjusted and the back flexed, then, it is well to give urotropin instead of digestants, for.

on the doctrine of chances, the infant is suffering from a pyelitis rather than an intestinal intoxication.

Our experience coerces the conclusion that pyelitis is more frequently overlooked than any other disease of infancy and childhood.

Instead of the old dictum, "When in doubt give mercury," we would promulgate a new pronouncement, applicable in infancy, "when in doubt give urotropin."

A fetid breath does not by any means indicate always a disordered stomach. We should think of a post-nasal infection. We should inspect carefully the mouth, nose and throat, for the cause of the fetor will usually be found thereabout.

The topography of the eastern section of Virginia is proverbial for the prevelance of malaria. The residenters here, in point of the medical profession, are more capacitated to speak authoritatively on this subject than those living in a higher clime, where malaria is the exception, but we have made an observation in this particular that we want to italicize.

All text books that we have consulted tell us that there is an absence of the septic factor in malaria, the differential blood count not showing a polynuclear leucocytosis. They also asseverate that there is a tendency to leucopenia instead of leucocytosis.

Until recently these teachments caused us many an anxious moment. To our own satisfaction we have definitely determined that the text book pronunciamentos on this subject are not true. In the last six weeks we have had three cases of malaria, positively identified by our able local technician, Dr. Caldwell, that yielded a blood picture the absolute antithesis of the accepted view thereabout. Each one of these cases had a leucocyte count of over 18,000 and in every case the polynuclear count was ninety per cent. or over, showing a marked tendency toward the septic factor.

I mention this because, in view of the blood picture, we were looking assiduously for pus and were not a little non-plussed at being unable to make a diagnosis, particularly in the last case we saw, as the child had been sick over five weeks. As soon as we discovered the plasmodium in the blood and began quinine, the blood picture began to transmogrify. It was interesting to observe that after giving quiuine for twenty-four hours the blood count fell to normal and the relative blood picture assumed a normal status.

The last thing that we will call attention to in this paper is the effect of the iodides on chorea. We have scanned eagerly the bibliography on chorea, but nowhere do we find any reference to the value of the iodides therein. The iodides may have been advocated by others at times but the knowledge thereof has never come under our purview.

Every now and then we see a case of chorea that has been treated along orthodox lines come into our office with a history of therapeutic failure. We put these cases on the iodides and we see very soon thereafter a gradual cessation of the chroeiform movements. The progression toward recovery is continuous under this therapy.

For exemplification, about five months ago there came from a nearby township a case of chorea with a history of several months' duration, in spite of arsenic. This was the most pitiable case I ever saw. The incoordinate, involuntary, jerky movements were of such magnitude that the child could only with the greatest difficulty maintain her equilibrium. We started her on the iodides and pushed them to the point of tolerance. Simultaneously, with the administration of the iodides, the choreiform movements began to abate until in about four weeks they had surceased completely. She is still taking the iodides intermittently though there has been no return of the choreiform phenomena. Temperament was even after choreiform movements subsided.

A paucity of material prevents us from making any extended observations along these lines. We have been thinking of a possible associative relationship between syphilis and chorea, and wondering if that explains the beneficent action of the iodides. It is a matter of common knowledge that in antiquity they gave arsenic for syphilis. In modernity we know its transcendent value in the form of 606. The question then arises, might not the value of arsenic in chorea be due to a specific action of the arsenic on a strain of the syphilictic virus or its pathology? No doubt, in the on-coming years these conjectures will be made transparent. At the present time, from an empirical viewpoint we would advocate the iodides in obdurate chorea, hoping that it will prove of practical utility in the hands of those interested in the welfare of the human race.

DISCUSSION

DR. F. D. WILSON, Norfolk: I have listened to Dr. Wilson's paper with much interest. I can not let pass his remarks about chorea without just a word as to some experience I have had. In a long series of cases in the Children's Hospital in Boston, routine Wassermanns on blood and spinal fluid in chorea cases were obtained, with uniformly negative results, no more than the usual incidence being found in the chorea cases. I just want to bring out that point because of the experience had with chorea and the Wassermann reaction, and keeping that in mind it would seem rather doubtful that the iodides could have any specific action because of any possible relation to lues.

DR. W. P. MCDOWELL, Norfolk: I regret that I was unable to hear all of Dr. Wilson's paper.

I would like to ask him a question in regard to treatment of chorea by the aid of the iodides. Dr. Wilson spoke of some of his patients who cleared up in the course of four week under the iodide treatment. Were these patients confined to rest in bed during this period? During the past few years I have had good results with some of my chorea patients following rest in bed for four or five weeks. without the administration of any medication.

I would also like to know the results of the blood Wassermann in these cases.

THE USE OF DRY MILK IN INFANT FEEDING.*

By WILLIAM B. McILWAINE, M. D., Petersburg, Va.

There is, as we know so well, no royal road to success in Infant Feeding. No artificial food has ever yet been able to fit one hundred per cent. of the cases on which it has been used. No Utopian idea of feeding all infants thus and so and, behold, a perfectly growing and developing race of babies, has yet been evolved. Not even the scheme of the "Back-to-Nature Baby" of Central Park, New York, who lives without clothes and eats an unscientific and wondrous diet, would fit even a small proportion of perfectly normal infants, no matter how strongly constituted.

As Dr. Chas. Hunter Dunn said, when asked, What is the best baby food, "There is no best. Each case is a law unto itself," and today, I believe, all pediatricians think that he is right. So, in writing on the use of dry milk, let it be distinctly understood that it is not that I consider dry milk the best food for an infant to be artifically fed, but only because I consider it a very important weapon in the armamentarium of a man who must feed infants with some food which is different from that designed by Nature for infants.

There is little new that I can bring before you as to the qualities and characteristics of dry milk that you do not probably already know. In Europe it has been used for many years and its place has been fairly well established. In this country, probably the foremost man in bringing it to the attention of physicians was Dr. Roger H. Dennett, of New York City.

In a paper read before the Medical Society of the State of New York, May, 1918, and later printed in the *New York State Medical Journal*, July, 1918, Dr. Dennett reported a series of fifty cases, and, with many case reports, showed distinctly that dry milk could and should be used in a variety of cases of both infants who were not doing well or were doing badly on other artificial food. His theoretical reasons for the ready digestibility of dried milk are: First, the change which takes place in the casein during the process of drying. The heat and loss of water separates the casein almost instantaneously into minute particles which remain in this state after water is added for feeding purposes. These particles remain separated in the infant's stomach and so are more easily digested than the larger masses or curds of fresh cow's milk. Second, the dried milk used was the preparation called "Dryco," which has a low percentage of fat, and this, in Dr. Dennett's opinion, renders it more easily digestible, especially in those cases where indigestion is due to faulty fat metabolism. Another reason is the fact that dried milk contains a large proportion of free fatty acids which re-act with the alkaline carbonates to form soap, and this in turn forms an emulsion which assists in the digestion of fats.

Aside from the digestibility of dried milk, there are many features, as brought out by Dr. Dennett and others, which make it a most helpful adjunct to infant feeding. It is, if properly prepared, sterile. It will keep almost indefinitely. It is not easily contaminated even by the most ignorant. It can be carried from place to place and so, in traveling, is a great help, and finally, it is simple of preparation.

Dr. Dennett concludes, "it is only one more weapon with which to combat digestive disturbances, one more resource at hand to use with infants of feeble digestion and to tide over a critical period in selected cases."

*Read at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31—November 3, 1922.

A French resume of dried milk in infant feeding by Ribadeau-Dumas, and published in May, 1922, gives us some interesting ideas, with many of which I do not agree, as,

1. Milk powders should not be kept longer than two months. Scurvy may occur if old powders are used.

I personally have used it after several months and Dr. Dennett reports no deterioration after one year's time.

2. Milk powders are not comparable with fresh milk.

While not chemically comparable, in my opinion they are most certainly far superior to a good many specimens of fresh cow's milk so far as infant feeding is concerned. Nor do I believe, as they state, that the albumen of fresh cow's milk is retained by the infant's tissues more readily than that of dried milk and that there is a greater renal effort for eliminating the mineral constituents of dried milk, nor do I consider, as they state, that the diet afforded by dry milk must be considered abnormal, or at least not more abnormal than that of fresh cow's milk mixtures.

I do agree with them when they state that dried milk is as good as other modified milk and has even better keeping qualities, when they say that it is prudent to use fruit juices with it and that, while it cannot replace breast milk, still it is useful to supplement maternal nursing and for cases when quick weaning is necessary.

Dr. John Lovett Morse, in an article published in the *Pennsylvania Medical Journal*, December, 1921, in discussing infant feeding, makes the statement that the present fad of using dried milk is fostered by the manufacturers. This statement made by so eminent an authority implies that dried milk feeding is a fad not based on a scientific background, with which I must disagree for, after all, a normal human breast will secrete dried cow's milk just as soon as it will fresh cow's milk and it is the adaptation of the food and not the food which means a well or sick baby.

Dr. Earl V. Wiednar, writing in the *Nebraska State Medical Journal*, July, 1922, after two years' experience with dry milk, comes to some very interesting conclusions:

(1). That it has a distinct advantage when there is any question as to the kind and purity of the milk.

(2). It is especially valuable as a summer food, as it is always sterile, keeps well and is easily prepared.

(3). It is very useful in traveling.

(4). It is more easily handled by the younger infants, and

(5) It is more economical as a food for complemental feeding.

I agree with these statements perfectly but, when he starts his cases immediately on orange juice and cod liver oil and adds oleomargarine to increase the fat, I personally fail to see the necessity after studying my cases for the past two years.

I realize, of course, that reporting fifty cases of any method of feeding means little as to the efficacy of that method, but it does show that any food which helps in the adjusting of infants to this world and which gives a large percentage of successful results should be used more frequently.

In this series of fifty cases that I am reporting, the infants were started on a preparation of dried milk called "Dryco," with the exception of Case 5, which was raised on "Klim," and Case 16, which was started on "Merrell-Soule" dried milk, but which was changed to "Dryco," as I considered the former had too high a percentage of fat. The earliest time of starting was five days. The oldest child started on "Dryco" was eight months. The time of continuing the "Dryco" was from two weeks to two and one-half years. Only two of my fifty cases were able to show altogether satisfactory results on 'Dryco" alone. Twenty-one received "Dryco" as complemental feeding to breast milk. Of these two received breast plus "Dryco" alone and nineteen breast plus "Dryco" plus sugar. Twenty-five received no breast but "Dryco" plus some sugar, either milk, cane or a mixture of "Dextri-Maltose." The results are summarized as to

(1). Condition when started;
(2). Gain in weight;
(3). Anatomical development;
(4). Mental development;
(5). Gastro-intestinal disturbances;
(6). Sleep and contentment when awake;
(7) Color;
(8). Susceptibility to infection;
(9). Other features, and
(10). General results.

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TABULATION OF RESULTS.

Number	Name	Condition When Started	Age	Feeding	Period on "Dryco"	Environment and Handling	Gain in Weight	Physical Development
1	W. B.	Poor	5 weeks	Dryco+Sugar	2 months	Poor	Good	Good.
2	S. B.	Fair	7 weeks	Dryco	6 weeks	Good	Splendid	Perfect.
3	G. B.	Fair	7 months	Dryco+Sugar	2 months	Fair	Good	Good.
4	M. C.	Poor	6 weeks	Dryco+Sugar	6 months	Fair	Good	Good.
5	J. F.	Good	2 months	Klim	2½ years	Good	Perfect	Slight Rickets.
6	C. F.	Good	3 weeks	Dryco+Sugar	6 weeks	Fair	Fair	Good.
7	H. G.	Poor	4 months	Dryco+Sugar	8 months	Good	Good	Perfect.
8	I. G.	Fair	10 weeks	Dryco+Sugar	3 months	Good	Perfect	Perfect.
9	R. H.	Good	1 week	Breast+Dryco+Sugar	7 months	Good	Perfect	Perfect.
10	W. M.	Very poor	1 month	Breast+Dryco	Off and on	Very poor	Poor	Poor.
11	W.McL	Good	2 weeks	Dryco+Sugar+Cream	18 months	Poor	Perfect	Perfect.
12	H. O.	Good	2 months	Breast+Dryco+Sugar	6 months	Good	Perfect	Perfect.
13	E. P.	Very poor	1 month	Breast+Dryco+Sugar	6 months	Very poor	Perfect	Perfect.
14	E. R.	Very poor	5 weeks	Dryco+Sugar	1 month	Very poor	Fair	Fair.
15	B. S.	Very poor	2 weeks	Dryco+Sugar	12 months	Very poor	Perfect	Perfect.
16	C. B.	Poor	4 months	Dryco+Starch	2 months	Very poor	Good	Good.
17	E. C.	Very poor	3 months	Dryco+Sugar	2 weeks	Very poor	Fair	Fair.
18	R. Z.	Poor	3½ months	Breast+Dryco+Sugar	5 months	Good	Perfect	Perfect.
19	K. W.	Poor	1 week	Breast+Dryco	12 months	Good	Perfect	Perfect.
20	J. W.	Good	1 month	Breast+Dryco+Sugar	1 month	Good	Perfect	Perfect.
21	M. W.	Good	3½ months	Breast+Dryco+Sugar	12 months	Good	Perfect	Perfect.
22	J. T.	Fair	8 months	Breast+Dryco+Sugar	3 months	Good	Fair	Fair.
23	L. S.	Fair	2½ months	Breast+Dryco+Sugar	10 months	Fair	Perfect	Perfect.
24	L. S.	Good	7 weeks	Breast+Dryco+Sugar	10 months	Good	Perfect	Perfect.
25	A. S.	Good	2 months	Breast+Dryco+Sugar	7 months	Good	Perfect	Perfect.
26	D. R.	Good	11 weeks	Breast+Dryco+Sugar	7 months	Good	Perfect	Perfect.
27	J. N.	Fair	4 months	Breast+Dryco+Sugar	4 months	Fair	Good	Good.
28	E. McC	Good	4 months	Breast+Dryco+Sugar	5 months	Good	Perfect	Perfect.
29	P. M.	Poor	3 weeks	Breast+Dryco+Sugar	6 months	Fair	Good	Good.
30	M. L.	Good	11 days	Dryco+Sugar	6 months	Good	Perfect	Perfect.
31	H. L.	Fair	1 week	Dryco+Sugar	12 months	Good	Perfect	Perfect.
32	R. J.	Fair	5 weeks	Breast+Dryco+Sugar	5 months	Fair	Good	Good.
33	L. J.	Good	2 weeks	Breast+Dryco+Sugar	12 months	Good	Perfect	Perfect.
34	P. G.	Good	2 months	Dryco+Sugar	2 months	Good	Perfect	Perfect.
35	P. G.	Good	5 weeks	Dryco+Sugar	5 months	Good	Perfect	Perfect.
36	M. G.	Good	3½ months	Dryco+Sugar	9 months	Good	Perfect	Perfect.
37	J. E.	Good	7 weeks	Breast+Dryco+Sugar	10 months	Good	Good	Good.
38	H. D.	Very poor	3½ months	Breast+Dryco+Sugar	2 months	Good	Perfect	Good.
39	S. C.	Poor	3 weeks	Breast+Dryco+Sugar	6 months	Good	Fair	Fair.
40	A. C.	Very poor	5 days	Dryco+Sugar	6 months	Good	Good	Good.
41	L. B.	Very poor	5 months	Dryco	1 month	Poor	Poor	Poor.
42	S. B.	Good	3 weeks	Breast+Dryco+Sugar	10 months	Good	Perfect	Perfect.
43	D. B.	Very poor	12 days	Dryco+Sugar	5 months	Good	Perfect	Perfect.
44	S. F.	Poor	7½ months	Dryco+Sugar	5 months	Good	Good	Perfect.
45	L. P.	Very poor	5 weeks	Dryco+Sugar	1 month	Very poor	Fair	Fair.
46	M. W.	Good	5 weeks	Dryco+Sugar	9 months	Fair	Perfect	Perfect.
47	H. K.	Good	4 weeks	Dryco	1 month	Good	Perfect	Perfect.
48	W. Y.	Fair	10 weeks	Dryco+Sugar	3 months	Fair	Fair	Good.
49	J. K.	Poor	4 months	Dryco+Sugar	3 months	Very poor	Fair	Fair.
50	C. T.	Fair	9 weeks	Dryco+Sugar	2 months	Fair	Perfect	Perfect.

I shall not go into these at length, but will state that the result, in my opinion, was as perfect as either mother or doctor could wish for in thirty-two cases, good in twelve cases, fair in two cases, and poor in four cases.

All of those which were classed as poor were sick infants with miserable home conditions and handling, and in a pitiable state of marasmus when started.

One of the two cases classed as fair, I expect to become good.

There are a few points brought to my mind by a study of these cases:

In Case 2, the baby, seven weeks old, was nursing an empty breast when put on "Dryco" alone. It progressed perfectly for six weeks, when it was taken to its home in New York City. There the doctor told the mother that

TABULATION OF RESULTS.

Number	Name	Mental Development	Gastro Intestinal Disturbances	Sleep and Contentment When Awake	Color	Susceptibility to Infection	General Results	Notes
1	W. B.	Good	None	Fair	Good	Normal	Good	
2	S. B.	Perfect	None	Good	Good	Normal	Perfect	Note in article.
3	G. B.	Good	Occasional Colic	Good	Good	Normal	Good	Note in article.
4	M. C.	Good	None	Good	Good	Normal	Good	
5	J. F.	Perfect	None	Perfect	Perfect	Normal	Good	
6	C. F.	Good	Several	Poor	Good	Normal	Good	
7	H. G.	Perfect	Several	Perfect	Good	Normal	Good	
8	I. G.	Perfect	None	Good	Good	Normal	Perfect	
9	R. H.	Perfect	None	Perfect	Perfect	Normal	Perfect	
10	W. M.	Poor	Often	Poor	Poor	Often	Poor	
11	W. McL	Good	Few	Perfect	Very pale	Normal	Good	
12	H. O.	Perfect	None	Perfect	Perfect	Normal	Perfect	
13	E. P.	Perfect	Several	Good	Good	Normal	Perfect	Note in article.
14	E. R.	Fair	Often	Fair	Fair	Very	Poor	
15	B. S.	Perfect	Occasional	Good	Perfect	Normal	Perfect	
16	C. B.	Good	Occasional	Good	Good	Normal	Good	
17	E. C.	Poor	Often	Poor	Fair	Very	Poor	
18	R. Z.	Perfect	None	Perfect	Perfect	Normal	Perfect	
19	K. W.	Perfect	None	Perfect	Perfect	Normal	Perfect	
20	J. W.	Perfect	None	Good	Perfect	Normal	Perfect	
21	M. W.	Perfect	Occasional	Perfect	Perfect	Normal	Perfect	
22	J. T.	Fair	Occasional	Good	Fair	Normal	Good	
23	L. S.	Perfect	None	Perfect	Perfect	Normal	Perfect	
24	L. S.	Perfect	None	Perfect	Perfect	Normal	Perfect	
25	A. S.	Perfect	None	Perfect	Perfect	Normal	Perfect	
26	D. R.	Perfect	None	Perfect	Perfect	Normal	Perfect	
27	J. N.	Good	Frequent	Good	Pale	Very	Good	
28	E. McC	Perfect	Few	Perfect	Perfect	Normal	Perfect	
29	P. M.	Perfect	Few	Perfect	Perfect	Normal	Perfect	
30	M. L.	Perfect	None	Perfect	Good	Normal	Perfect	
31	H. L.	Perfect	Few	Perfect	Perfect	Normal	Perfect	
32	R. J.	Good	None	Good	Good	Normal	Good	
33	L. J.	Perfect	None	Perfect	Perfect	Normal	Perfect	
34	P. G.	Perfect	None	Perfect	Perfect	Normal	Perfect	
35	P. G.	Perfect	None	Perfect	Perfect	Normal	Perfect	
36	M. G.	Perfect	None	Perfect	Perfect	Normal	Perfect	
37	J. E.	Perfect	Occasional	Good	Good	Normal	Perfect	Note in article.
38	H. D.	Perfect	Occasional	Good	Good	Normal	Perfect	
39	S. C.	Perfect	None	Poor	Fair	Normal	Perfect	Note in article.
40	A. C.	None	None	Good	Good	Normal	Perfect	
41	L. B.	Fair	Frequent	Perfect	Fair	Normal	Poor	
42	S. B.	Perfect	None	Perfect	Perfect	Normal	Perfect	
43	D. B.	Perfect	None	Perfect	Perfect	Normal	Perfect	
44	S. F.	Perfect	None	Fair	Perfect	Normal	Perfect	
45	L. P.	Fair	None	Perfect	Fair	Normal	Fair	Note in article.
46	M. W.	Perfect	None	Perfect	Perfect	Normal	Perfect	
47	H. K.	Perfect	None	Good	Perfect	Normal	Perfect	
48	W. Y.	Perfect	Frequent	Good	Good	Normal	Good	
49	J. K.	Fair	Occasional	Good	Pale	Normal	Fair	
50	C. T.	Perfect	None	Perfect	Perfect	Normal	Perfect	

"Dryco" was not a correct food for babies, it fattened but gave no strength. He took it immediately off of the dried milk, and put it on fresh cow's milk. The baby had a violent diarrhea, and lost weight rapidly. One of the most distinguished pediatrists of New York City was called in. He, too, for what reason I know not, stated that "Dryco" was a fattening food and not correct for infant feeding. After much trouble and expense, including an operation for mastoid, the baby was finally straightened out. If there could be any more foolish handling of a baby progressing nicely, I have yet to come across it. Even the mightest can err.

Case 3 had an imperforate anus, with passage of the feces through the vagina, but, on "Dryco," "Dextri-Maltose" and starch, the

stools were kept soft enough to prevent irritation to the vaginal canal and the child progressed nicely.

Case 13 progressed perfectly on "Dryco" and "Dextri-Maltose" until it had a general pyemia and double otitis, and, even through the final illness, the stools were remarkably good.

Case 37, while on the breast and "Dryco," progressed nicely in spite of several illnesess, catarrhal otitis, bronchitis, and influenza.

Case 39 was a cerebral hemorrhage case, which at five days seemed at the point of death. However, it developed physically well on "Dryco" and "Dextri-Maltose" until its death at seven months.

Case 45, which at present is classed as only fair, was started under the most unfavorable circumstances. The baby responded perfectly to the treatment it was receiving of being fed as much as it wanted whenever it cried, of whatever the mother guessed was right, and had two convulsions and temperature 106°. After a thorough cleaning out, it was started on "Dryco" and seems to be progressing satisfactorily.

After studying these cases in private practice and others at the Petersburg Child's Welfare Centre, I have come to the following conclusions:

(1). "Dryco" is a most valuable adjunct in infant feeding, and should be in use by every doctor who feeds infants, not on all cases, of course, but each should become familiar with it and its advantages;

(2). As a complemental feeding to the breast, it is of first choice, because it is clean, easily handled, easy of digestion and seems to fit perfectly with whatever breast milk is available;

(3). "Dryco," fed alone, is not as successful as "Dryco" plus some corbohydrate, for, I believe, in opposition to many pediatrists, but in accord with some, that most infants thrive best on at least seven per cent. sugar and at times higher;

(4). It is advisable to add orange juice at the age of three months, for I trust no food which has been subjected to heat as to the viability of the vitamines;

(5). Fresh cow's milk should be added to all children's dietary by the tenth month, for it is to be given throughout the entire life of the child, whether a breast or bottle baby;

(6). If there is any difference between the results of a baby raised to beautiful childhood on "Dryco" or fresh cow's milk, my cases have failed to show it; and

(7). The more dried milk is used, the more secure the physician feels as to the safety of the infant, and the more pleased he is with the results.

In concluding, let me say that I would refer any one to Dr. Dennett's paper for the methods of giving "Dryco," as to the percentages and calories, and the general rules for prescribing it for infants, but I belive firmly that there is no method as good as the careful watching of the individual infant and varying the food according to the needs of that individual infant. Successful infant feeding is, in my opinion, a critical, careful attention to details.

DISCUSSION.

DR. W. L. HARRIS, Norfolk: This subject of infant feeding, of course, is one that interests all of us and especially those who do much work with children. Of course, there have been fads in infant feeding from time immemorial and a most amusing thing to me is how people are always ready to jump at something new and drop something that has been entirely satisfactory.

I look upon dry milk as a makeshift to be used only under certain conditions; to be used in traveling, or among the poorer people who can not buy or properly keep fresh milk. I do not believe any canned goods is a substitute for fresh goods. I believe we can feed children successfuly on almost anything for a certain number of cases. We may have fifty cases or a hundred, but if we are compiling statistics they should cover many thousand cases.

I do not wish to attempt to run down dried milk but I don't want any of you to think it is a substitute for cow's milk properly handled. I use it very little, and I have had to take a great many cases off it that were sent to me that were not doing well. I do not believe we ought to be overly enthusiastic over dried milk any more than we should over condensed milk or malted milk or some other prepared infant foods. Dried milk is undoubtedly the best of all these canned goods, because it has a reasonable proportion of fats and proteids, but it should not in any sense be considered a satisfactory substitute for fresh cow's milk and should be used only for temporary use, such as in traveling or it may be used when good cow's milk is not to be had or among the poor who cannot properly keep or handle fresh cow's milk.

DR. W. B. MCILWAINE, Petersburg: I have very little further to add. Whether in the cities or in small communities or in the country, I think Dryco is a great adjunct to infant feeding. I don't quite see how it can be called a fad any more than you would call feeding on cow's milk a fad. Fresh cow's

milk is just as abnormal for infant feeding as dried milk; the only normal food is mother's milk.

I feed babies a lot of fresh cow's milk. I have seen infants fed on cow's milk in New York and Boston and I have seen them fed on dry milk, and I have fed them on both. I think Dryco will be found of use in the handling of infants in any community.

AN EXANTHEM OCCURRING IN INFANTS, WITH UNUSUAL SYMPTOMATOLOGY.*

By CHARLES E. CONRAD, M. D., Harrisonburg, Va.

The condition I wish to call attention to does not appear in the text books though many of you may have seen similar cases. It consists of a high fever, about 104° F., with restlessness and loss of appetite, lasting three or four days without any definite physical findings, then a sudden drop in temperature; about twenty-four hours after the baby's temperature returns to normal, there appears a red macular and maculo-papular eruption over the body which resembles the rash of measles in appearance. In the two cases I saw, the rash began on the upper portion of the chest, rapidly extending over the trunk and to a less degree to face and extremities. Both cases were under two years of age, one twenty-one months and one eight months. The latter was breast-fed except for two to four ounces of cow's milk a day which had been given three or four weeks.

Aside from the high temperature, 104° F. in one, 104.5° in the other, fretfulness and loss of appetite, I was unable to find any physical signs to account for the high temperature.

Both babies had sudden rise in temperature, were very fretful, and refused most of their food. They had not vomited, stools were normal, throat and tonsils were normal and ear drums normal in appearance; in fact, as stated above, I was unable to make out any cause for the fever. Temperature, when first seen, was 104° F. in one and 104.5° in the other. This high temperature and restlessness continued three days without developing any other physical signs. In one case, the mother 'phoned me in the morning of the fourth day it was not necessary for me to return, as the baby did not have any fever, was playful and hungry. That afternoon she 'phoned that I should come, as the baby was "all broken out." When I saw the baby, she had a rectal temperature of 98° F., was playful and happy, with a bright red macular and maculo-papular eruption, resembling the rash of measles, over chest, abdomen and, to a less extent, over face, neck and extremities. The rash lasted three days, and I was unable to make out any scaling. Child was never uncomfortable and did not have any return of fever after the initial drop in temperature.

Urine examination was negative. Blood count, which was done on the younger baby, gave a white blood count of 4,600 and a differential count of 11% polymorphonuclears and 89% lymphocytes, showing a leukopenia with lymphocytosis.

The condition does not appear to be contagious, as in both homes were two other young children and none of them contracted it, although brought in direct contact.

DIAGNOSIS.—During the pre-eruptive stage, one would think of pyelitis or acute otitis media, but both were easily ruled out, or the so-called central pneumonia. After the eruption appears, one would think of measles or rubella.

In measles you have the coryza, Koplik spots, and the eruption appearing at the height of the fever.

In rubella there is usually glandular involvement, and the rash appears with the fever.

SUMMARY.—We have a disease occurring in infants, with a high fever, loss of appetite, and fretfulness, without any physical signs, and twelve to twenty-four hours after the fever subsides there appears a macular and maculo-papular eruption. After the febrile stage, the infant is perfectly comfortable and happy, and does not appear to be at all sick during the period of the rash. With this there is a leukopenia, with lymphocytosis.

Zahorsky has called it "Roseola Infantum," Veeder and Hempleman suggest "Exanthem Subitum," and Greenthal in cases reported by him does not suggest a name but believes as I do that this is a definite disease entity.

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BALANCING THE RATION IN SEVERE DIABETES.*

By ALEXANDER G. BROWN, JR., A. B., M. D.,

Associate Professor of Medicine, Medical College of Virginia. Internist, Stuart Circle Hospital, Richmond Va.

If there are a half million diabetics in this country and if obese persons are candidates for the diabetic state, it would seem that one may rightfully approach the much discussed question of balancing the ration of the diabetic with the assurance of dealing with a subject worthy of every interest on the part of the medical profession. There are two factors, apparently, that enter into this widespread and increasing incidence of diabetes. One of these factors is the prevalence of obesity or overweight in the people of this country: a striking characteristic of the candy-and-starch-eating-Americans. The other factor is the focal infections. The breaking down of the carbohydrate mechanism of the body may be brought about by the constant and life-long over-use as well as by the pathologic injury from some infective process. Every precaution for proper regulation of the diet of persons with overweight and the eradication of lurking infections should be put into effect.

Diabetics may become active workers in the campaign for the reduction of weight of the obese. This is one way by which the control of diabetes may be more easily brought about. At the same time extremely useful instruction and education may be given the mild diabetic for his dietary guidance in after life. Instruction in the problem of diabetic feeding intelligently handled by the physician, excites a wonderful enthusiasm in the mind of the layman and makes him an alert pupil and loyal disciple of accurate feeding.

However, from the standpoint of medicine, one may say that the last word concerning the diabetic management of diabetes has not been as yet said. Clinicians reading the literature and working actively in this field can hardly fail to be impressed with the rapidly changing thought on this question. Fortunately, in these latter days, the constantly modifying lines of diet are more complementary than antagonistic. In fact, this satisfying characteristic stands out boldly as a beacon of hope: very contrary to a former time, with its oatmeal-diet, its banana-diet, its milk-diet, its potato-diet, etc. Then, there was much confusion and many conflicts in the treatment of diabetes mellitus. At the same time, as one now hears advocates of a dietary of very different values in certain types, the conclusion in that final decision, as to what diet is correct in diabetes in severe type, is not reached as yet. In these days, however, all appear to agree on certain fundamental principles to be sought and to be prevented in rationing the diabetic. The differences of method are merely in the refinements of the balancing and proportioning rather than in the sort of food to be used. All agree that the great purpose is to make the diabetic sugar-free in urine; to bring the blood sugar within reasonable limits to normal; and to prevent the formation of the ketones in the blood in excess as shown by marked occurrence of acetone bodies in the urine. All agree, it seems, that this is rather satisfactorily accomplished in the incipient and mild cases of diabetes by the fast; the measured or restricted carbohydrate diet; and gradual loss of weight in the obese. But in the severe cases (of diabetes) there is room for greater unanimity in the scheme of the dietary management.

To overcome this partial failure some recent work has been done with the view of more carefully balancing the fat-protein-carbohydrate elements in order to prevent sugar-urine and acidosis. Whereas "the carbohydrate tolerance" was the state sought in the recent past, in the diabetic, now, the "nitrogen balance" and the "ketogenic antiketogenic balance" and "basal metabolism rate" are present-day states to be found in the management of severe diabetes.

Ketosis is the "terror" of diabetes. These substances arise from the fats. If proper carbohydrates are available these poison products of fat are prevented. Some one has aptly put it that "the fats are burned in flame of carbohydrates." Only in presence of available carbohydrate can ketosis be prevented.

In the light of these more recent advances in dietary management of diabetic patients, the following principles should be observed: (1) a limited diet-calory, (2) a limited and gram-measured carbohydrate diet (ketogen and antiketogenic balance), (3) a limited and definite gram protein diet (nitrogen balance), a high fat diet in grams to secure needed calories, protected by sufficient grams of carbohydrates to prevent ketosis.

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Owing to the leadership of Allen, who revived the fasting treatment in diabetes and urged the importance of resting the carbohydrate mechanism by restricting the total calory, the general principle that diabetics should practice a definite restriction of diet with a view to a reduction in bodily weight and to a slowing of the metabolic rate is now generally followed in the diabetic therapy.

Wilder's interesting article has recently pointed out the confusion that has arisen in regard to the loss of body weight alone in the improvement of carbohydrate tolerance. He has pointed out that an excess of protein intake produces an increase in metabolic rate in diabetes and that a too rigid fasting or starving diet, which requires the body to draw upon the body protein causes a high metabolic rate. So a low maintenance food total should be so balanced as to slow the metabolic rate (controlled by protein adjustment in non-hyperthyroid and non-ketogenic cases) and this adjustment should give adequate nutrition, with no gain of weight in body mass. Under this balance of restricted diet the diabetic moves in a slow metabolic rate which is more favorable for diabetic well being.

Nitrogen-Balance-in-Diabetes. (Protein Restriction).

Marsh, Newburgh and Hally, cited by Wilder, should be credited with pointing out the need for restricted protein grams intake in diabetes. The following points are cited to support the importance of a definite restriction of protein:

(1). Protein is convertible into sugar by weight 58 per cent; thus when used over minimal requirements adds sugar to the diet;

(2) Protein, when over minimal requirements, tends to produce "an undesirable elevation of the metabolic rate";

(3). Excess of proteid, over nitrogen balance requirements, depresses the ability of the body to oxidize glucose.

Wilder cities the publications of Marsh, Newburgh and Hally, to show that minimal protein requirements for normal and diabetic persons receiving minimal total calories for weight maintenance should never be over two-thirds of a gram per kilogram body weight. This may be increased in children for growth requirements to one gram per kilogram body weight. This proteid allowance is expected to maintain a nitrogen balance, which will not add sugar, not increase the metabolic rate and not interfere or depress glucose oxidation. Nitrogen balance is thus a first step in diabetic dietary.

Carbohydrate Tolerance.

The widespread practice in all forms of diabetes (mild and severe cases) of determining the carbohydrate tolerance has clearly placed this phase of low carbohydrate feeding upon a firmer footing. In severe cases, where the tolerance is apparently nil, it would seem necessary to interdict the use of all possible forms of actual carbohydrates and to rely upon the high fats and the proteid (sugar) for body maintenance. But this practice brings the patient to the poisonous state of ketosis. So it is necessary to work upon a basis of diet, framed upon the fundamental minimal protein requirements, thus cutting out all sources of sugar and adding a carbohydrate quota to the diet sufficient to "pace" the high fats to the point of minimal calories for the body strength and weight, without ketosis.

High Fats (Ketogenic Antiketogenic Balance).

Every therapist has had disastrous results in the high fat diet. Many have had to restrict the high fat because of the diabetic coma, of the acidosis, of the ketosis. So recently the high fat diet has been avoided. But Newburgh and Marsh have obtained interesting and telling results on high fats diet in relation to a nitrogen balance and a minimal amount of carbohydrate allowance. It seems then, in the light of Newburgh's results, safe to allow for the low-caloric value of a diet enough in carbohydrates and proteins the additional fats to supply minimal daily caloric requirements. The ketogenic products of fat metabolism are kept out of the body by balancing in the diet anti-ketogenic glucose.

It seems quite obvious then that if the protein over minimal requirement is capable of being converted into sugar to the amount of 58 per cent of its weight, if it influences the metabolic rate, if it is given in excess of required amount for balancing the nitrogen loss of the body, it is especially depressing upon the body in utilizing it for glucose, and if two-thirds gram per kilo body weight of patient is the ideal amount, we have secured a fundamental work-point of metabolism in balancing

the diet of the diabetic for the prevention of acidosis.

To utilize properly the recent work in dieting severe cases of diabetes, it is necessary to recall that the calory and nitrogen values of diet must meet the needs of the total calory requirements of the body and also the nitrogen balance of the protein metabolism. If the body is required to call upon its own fat, protein acidosis bodies form.

The calculation of diet by use of the chart for basal metabolic rate determinations merely adds another refinement to the computation of the diabetic feeding. There is a known basal rate based on factors of age, sex, height and weight for surface area. I have found in treating severe diabetes, Dubois' "A" Chart prepared by Boothby and Sandiford very useful for accurate and easy calculation of normal basal calory requirements. And when used in connection with Wilder's suggested diabetic chart, based on 2/3 gram allowance of protein for each kilo body weight, we have a ready method of balancing the factors of carbohydrate-protein-fat on the basis of high fat, low carbohydrate and 2/3 gram protein kilo body weight. By this system of feeding we obtain usually (1) a sufficient caloric value for body weight and strength, (2) a free or low sugar in the urine, (3) no acidosis.

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THE VALUE OF BASAL METABOLISM STUDIES IN THYROID DISEASE.*

By JAMES H. SMITH, M. D., Richmond Va.
Associate in Medicine, Medical College of Virginia.

The place in the clinic of any new method must be determined by clinical standards. A reasonable simplicity of technique is one requirement; that the use of the method shall square with end results in the clinic is another. With regard to indirect calorimetry, the former has been achieved; the test of the latter must await the lapse of considerable time. Data are rapidly accumulating, however, establishing the value of the method. To this end, it seems useful to compare symptoms and signs and clinical course on the one hand, with metabolism studies on the other. To avoid too much detail, a few generalizations are necessary.

Six symptoms or symptom-groups may be considered more or less diagnostic of thyroid overactivity, viz: Goiter, exophthalmos and other classical eye changes, tachycardia, nervousness, loss of weight, and tremor. As is well known, the significance of thyroid enlargement does not vary directly with its size, but rather with its associated symptoms. The exophthalmos of toxic goiter is usually easy to distinguish from a normal even though exaggerated prominence of the eye-ball, and is confirmed by the presence of the Stelwag, von Graefe and Moebius signs. The term tachycardia will be arbitrarily used to refer to a pulse rate usually over 100 and not falling below 90 even under the basal conditions of the test. Nervousness and tremor are necessarily somewhat vague terms, but by loss of weight is meant something more than five per cent. of the recent normal body weight. The plan of this paper is an analysis of these symptoms and signs as compared with the basal metabolic rate in 101 tests on 84 patients.

Goiter, exophthalmos and tachycardia are rarely seen without the other classical symptoms, and, occurring together, are practically diagnostic of exophthalmic goiter.* Eight cases were in this group with rates between plus 51 and plus 97.

Exophthalmos may be lacking, but if there is goiter, tachycardia, and either marked loss of weight, nervousness, or tremor, hyperthyroidism may be considered to exist in the absence of other apparent cause for the symptoms. There were 18 such instances, with rates between plus 21 and plus 59.

In the 26 tests referred to in the two preceding groups, there was a rough general agreement as to the severity as gauged by the clinical and metabolic standards, respectively. It is also interesting to note that the exoph-

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*Lieb, Hyman and Kessel, (J. A. M. A., 79, 14, p. 1099) report 86 cases, "with many or even all of the classical clinical symptoms of the textbook picture of exophthalmic goiter," with a normal basal metabolism and who "did not suffer from that disease."
The small series herein reported includes no case in any sense presenting the classical picture of exophthalmic goiter with a normal metabolism. One case with all the classical signs except goiter, had a rate of plus 40.

thalmic group showed a distinctly higher average rate than the group without exophthalmos.

Next to be considered is a group of 39 tests done for a thyroid condition giving normal metabolism figures, between minus 10 and plus 10. Of these there were 16 cases with more or less of nervousness, loss of weight, or tremor, or a combination of these symptoms. Manifestly, thyroid hyperactivity is not clinically established, and a normal metabolism rate is hardly open to question on clinical grounds. It may seem that this conclusion should have been reached independently of the metabolism test. The fact remains that these 16 cases were referred by ten practitioners of recognized ability, most of them sent with the special purpose of determining the metabolism, the thyroid being under suspicion. The test may, therefore, be considered useful in these cases.

Fourteen other cases were in practically the same group symptomatically, but with some enlargement of the thyroid, varying from a little fullness to moderate enlargement, and showing normal metabolic rates. It is to be noted here that no considerable increase in pulse rate was present in any, and, of course, no exophthalmos. It may well be questioned whether the metabolic rate in these cases may be accepted as conclusive. To date, I have no reason to believe that any of them were misleading.

The remaining 9 cases in this group of normal rates are quickly accounted for. Two were cases previously operated on for exophthalmic goiter. In one, the post-operative condition was far from being as satisfactory as the metabolic rate would indicate, though the pulse rate was normal. Her metabolism had not been done prior to operation. The other showed clinical improvement almost commensurate with the metabolism.

One case had returned to normal clinically and in rate following removal of infected tonsils. There had been an unquestionable toxic thyroid activity with a rate of plus 33.

Six were examined for subactivity of the thyroid, chiefly on account of obesity, and were found to have rates within normal limits.

The kind of goiter which, by reason of its characteristics and the absence of so-called toxic symptoms, we call non-toxic, simple or colloid, may be expected to give a normal or lowered metabolism. In the three cases of goiter of this type in the series, the rate was normal.

The preceding definitions probably make sufficiently clear what is referred to as clinically border-line hyperthyroidal states. As illustrative, may be cited Test No. 50, a female, aged 32, thyroid moderately enlarged for six years; somewhat nervous, slight tremor and loss of weight. No tachycardia nor exophthalmos. Basal metabolic rate plus 17. In this group classed as border-line clinically, and with rates from plus 11 to plus 20, there were 18 cases.

The series included 3 subnormal rates, two of minus 13 each and one of minus 27. One of the cases with a rate of minus 13 was considered to be due to pituitary hypofunction; the other was an instance of thyroid poverty, having previously shown a rate of minus 30 and having taken thyroid extract. The rate of minus 27 was also in a case showing clear signs of thyroid underactivity.

Eight additional cases gave normal figures, but the thyroid was not under suspicion.

There have been mentioned 97 tests which, by the best standards I am able to apply, were a true index of the thyroid condition. I wish now to refer to 4 tests which were considered unsatisfactory, though none could have led to gross error if interpreted with reasonable conservatism.

Anyone familiar with the technique of indirect calorimetry, can readily mention several sources of error toward the plus side. One of the most prolific sources of trouble is a leak in the apparatus or in the adjustment of the nose and mouth pieces. Some such trouble probably accounted for a reading of plus 27 in Test No. 40. This was higher than the clinical condition seemed to justify and, when repeated two days later, a rate of plus 9 was obtained. Similarly, Tests Nos. 97 and 104 resulted in questionable rates of plus 23 each, without the opportunity being afforded to repeat the work.

On the other hand, there is less apparent risk of getting too low readings. I know of no likely causes other than mathematical errors, subnormal body temperatures, and shock. Nevertheless, Test No. 72 gave plus 11 though the patient had thyroid enlargement (noticed only a few days before), loss of 8 per cent. body weight, pulse 92 to 100, was nervous and had a fine tremor. The test re-

peated seven weeks later showed a rate of plus 17, in spite of the fact that the pulse rate was 20 beats per minute slower. It is true that the symptoms were recent in onset, but one would expect the metabolic rate to be influenced at least as early as signs arise.

Metabolism determinations by no means settle all the questions raised by the thyroid gland, as illustrated by Test No. 3. A female, aged 54, had two partial thyroidectomies for exophthalmic goiter. Following the second, she developed slow pulse (in the fifties), sensitiveness to cold, gain in weight, painful lower extremities, and an extensive dermatitis. The eyes remained exophthalmic and deep reflexes very active. Thyroid extract seemed beneficial in spite of the fact that the metabolic rate was found to be plus 25 and plus 24 by different technicians and different types of apparatus, no thyroid extract having been administered for more than two weeks previous to the tests. The patient states that she can tell when the indications arise for resuming the thyroid extract.

Test No. 92 gave a rate of plus 21 with normal body temperature. A day or two later her physician discovered tubercle bacilli in the sputum. It is not unlikely that the metabolic rate represented accurately the activity of the thyroid. In a previous paper,* I discussed the relationship of hyperthyroidism and tuberculosis, and called attention to the danger of radical treatment of the thyroid when active tuberculosis exists.

Test No. 93 gave what might be called a genuine thyroid figure, plus 38. She was, however, the subject of severe nephritis; blood pressure 250/170; phthalein output 5 per cent. in two hours. Others have reported similar cases, and no conclusion as to thyroid function should be drawn from the metabolic rate alone.

The foregoing analysis is summarized in Table I.

A. Rates over plus 20, clinically hyperthyroid:		
(a) With goiter, exophthalmos and tachycardia	8	
(b) Without exophthalmos; with goiter, tachycardia and other symptoms or signs	18	
		26
B. Rates between minus 10 and plus 10:		
(a) With a combination of nervousness, loss of weight, and tremor, but without goiter, exophthalmos or tachycardia under basal conditions	16	
(b) Same as (a) except for the presence of more or less thyroid enlargement	14	
(c) Previously operated for toxic goiter	2	
(d) Previously toxic goiter returning to clinical normal after tonsillectomy	1	
(e) Obesity	6	
		39
C. Rates plus 11 to plus 20; clinically borderline hyperthyroid		18
D. Rates minus 10 to plus 10; colloid goiters		3
E. Subnormal rates, minus 13 to minus 27:		
(a) Clinically hypothyroid, minus 13 and minus 27	2	
(b) Clinically hypopituitary, minus 13	1	
		3
F. Rates minus 10 to plus 10; a clinically miscellaneous group not suspected of thyroid abnormality		8
G. Rate moderately increased, plus 23 to plus 27, not clinically confirmed:		
(a) Plus 27 repeated with result of plus 9	1	
(b) Plus 23 and plus 23 not repeated	2	
		3
H. Rate plus 11, apparently too low, seven weeks later plus 17		1
		101

Discussion.

The limits of the paper have made it necessary to confine our subject to the thyroid. Little confusion is apt to arise from other diseases which affect the rate of metabolism, for these are not often difficult of recognition.

On the plus side are the severe anaemias, leukemia, and febrile states; on either the plus or minus side, diabetes, and abnormal pituitary and adrenal states. The last two, on account of the frequency of mixed endocrine abnormalities, are most apt to be misinterpreted.

The method used in the cases reported, was the determination of oxygen consumption without regard to carbon dioxide output. The apparatus was one of the simplest of the many varieties now on the market. It contains no blower and requires no electrical connections. I can well understand the aversion of a thorough-going scientist to methods introducing larger factors of error in studies of functional pathology. I am not sure that this objection is at all applicable here, but to the clinician, a workable instrument, if it is reasonably accurate, is more useful than one giving ultra-refinement of results at the cost of all considerations of time and circumstance.

With regard to metabolism and the thyroid, we must think in terms of tens rather than ones. No matter where we set the figures for normal, one above or below means nothing.

*Differential Diagnosis between Pulmonary Tuberculosis and Hyperthyroidism; Southern Med. & Surg., Dec., 1921.

If a patient with a rate of plus 45 has received treatment, and the rate is later found to be plus 42, I will not say that nothing has been accomplished, because further improvement may yet come, but the slight differenence in rate does not indicate that anything has been accomplished. Minus 13 means very little more than minus 10. One would probably give some thyroid preparation in one case about as readily as in the other.

A distinction should be made between acceptable figures, believed to be indicative of the true basal rate, and the interpretation put on those figures. As already suggested, it should be borne in mind that figures above normal are more likely to be in error than normal or subnormal figures. As Means and Burgess* put it: "The finding of normal rates in persons suspected of having hyperthyroidism practically rules that condition out, but the finding of an elevated rate does not necessarily rule it in."

Such scattered references as have been made to therapeutic procedures are purely incidental. Sufficient time has not elapsed to justify conclusions as to comparative values of different methods. With one exception already mentioned, clinical improvement was as a rule faithfully reflected in the metabolism.

Neither metabolic studies nor any other criterion has as yet resulted in general agreement on the treatment of hyperthyroidism. Nevertheless the severity of the disease in a given individual must influence everyone. The metabolism, therefore, as an index to severity, should prove helpful to the clinician in applying such ideas of treatment as he may hold. Particularly is this true when the rate is found to be rising on consecutive tests such circumstances being usually regarded as contraindicative to operation at the time. As a means of estimating the results of treatment, the metabolism is perhaps the best single index.

For diagnosis, the metabolic rate is often unnecessary, but it is just in this type of case that its value as a gauge of progress is greatest. A border-line case found to have a border-line metabolism, may result in a border-line state of mind in the clinician. This would seem to be exactly what the interests of the patient demand. The metabolic rate should never be interpreted independently of the clinical condition, but it is perhaps the most significant single index of thyroid activity.

*Means, James H. and Burgess, Harriett W.: Arch. Int. Med.; 30, No. 4.

DELAYED UNION IN NON-INFECTED WOUNDS ABOVE THE UMBILICUS.*

By ARTHUR S. BRINKLEY, M. D., Richmond, Va.

Having had several cases of delayed union in wounds of the epigastrium, in or near the mid line,without apparent cause, I decided to look up the literature to see what I could find out about the matter. I found only two articles bearing directly upon the subject. The first is by Robert T. Morris, of New York City, and was published in the *Journal of American Medical Association*, June, 1911. The title of this paper, "The Gastric Weak Line," is very pertinent. The second is by Miles Porter, of Fort Wayne, Ind., and was published in the *American Journal of Obstetrics and Diseases of Women and Children*, Vol. 10, 1914.

I will quote at length from Porter's article. In his paper he states that Morris' article is the only one he could find in the literature bearing directly on the subject. He quotes excerpts from letters written by a number of his surgical friends. Of the operators from whom he received replies, fifteen express the opinion that mid line epigastric incisions were peculiarly prone to delayed union, and five had never observed any difference from wounds above the umbilicus. Following are excerpts from some of the replies received by Dr. Porter:

"Abbe writes that it is notorious that incisions in the epigastric region need extra support in suturing. Jonas also, who has had no experience with delayed union in epigastric wounds, attributes his freedom from this annoyance to the fact that he takes particular care in suturing these wounds, and leaves the non-absorbent stitches in situ for ten days or longer. Oliver and Eastman, of Indiana, and Bloodgood, of Baltimore, attributed the trouble they had had to catgut. Deaver says he sees no reason why wounds in any part of the abdomen should not heal satisfactorily in the absence of infection. Morris says the failure to repair of wounds in the abdominal wall after stomach operations is due to trophic or neuro-

*Read at the fifty-third annaual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

vascular disturbances, associated with sensory nerve disturbance in the sensory zone of Head. W. J. Mayo and Willy Meyer are inclined to the opinion that soiling of these wounds with gastric or bowel secretions produces a necrosis of the cells, and thus delays the union. A. G. Gerster reports that he has found union in wounds above the umbilicus tardier in all cases of malnutrition, especially cancer in its progressed stages; but he says further back of all there must lie biochemical causes, as yet unknown to science. Brewer states that he believes that malignancy plays an important part and, where it does not exist, he feels that they heal as readily as other wounds. Powers, of Denver, remarks that all of his cases occurred in people far reduced in general health. Meyer, Eastman, Abbe, Lilienthal, Finney, and others, lay stress on the tension of the abdominal walls, due to muscular pull, as a cause of non-union in epigastric wounds. Eastman refers especially to the sudden tension these wounds are subjected to through sneezing and coughing, by reason of the close proximity to the diaphragm."

In order to get a more general opinion regarding the subject, I wrote seventeen prominent surgeons in different sections of the country, and so far I have heard from fifteen of them. Nine of this number had experienced trouble with non-infected wounds in this area, and six had not noticed any especial difference in the healing of wounds above or below the umbilicus.

Erdmann writes: "I have observed in our institution, as well as in other institutions where I have worked, that a certain percentage of patients suffering with gastric carcinoma. or those badly impoverished by some other type of disease, will not unite; that they break down somewhere between the fifth and eighth day, and in many of those no vestige of catgut is to be found. A simple suture sewing through and through with silkwormgut is followed in all these patients with union." He estimates roughly that it occurs in one-tenth of one per cent. of his patients.

Horsley reports that he has no definite statistics, but is confident that there is a very decided tendency toward slow healing in abdominal wounds above the navel. His explanation is as follows: "There is more motion in the abdominal wall above the navel than below it, and this constant motion renders healing slower, explained on the same principle as wounds in the region of the sphincter ani which do not heal readily until the motion of the sphincter is temporarily abolished." He also thinks the rigid margin of the ribs makes more tension on wounds in this area. He does not believe Head's theory of some peculiarity of innervation holds good.

Finney remarks that on a number of occasions he has seen perfectly clean wounds, the edges of which for some unexplained reason declined to unite and heal in the ordinary way. He had no notes at hand but was inclined to believe it was more likely to occur in rather weak or debilitated, and in fat, anemic individuals. He had no explanation of it, and simply noted the fact with interest in passing.

Pool has noticed this condition particularly in epigastric incisions for carcinoma of the stomach, but he has also observed that it happened in other types of cases. He thinks the principal reason for this delayed union in upper abdominal wounds is due to the fact that in the upper abdomen, the peritoneum, transversalis fascia and expansion inward of the transversalis muscle are practically one structure, as far as the suture of the wound is concerned. The transversalis is rigid and its fibres are transverse, so that sutures readily tear out, and at the same time tear out of the underlying peritoneum. The transversalis being attached to the costal cartilages draws the edges of the wound apart in every respiratory act, and that this line of suture in epigastric wounds, especially near the mid line, thus frequently gives way. Intra-abdominal pressure can then very readily separate the overlying sutures, especially in tissues of which the vitality is diminished.

Willard Bartlett writes, "I have had a number of such cases and the only explanation I could ever offer was that they were due to the cross pull exerted by the lower segments of the chest wall, in connection with deep respiration, vomiting, coughing, straining at stool or urination."

J. E. Thompson reports that he has had three cases, in which the wound, apparently non-infected, opened up widely of its own accord after the stitches were removed. One case was a gastro-enterostomy, one an exploration, and the third an exploration with drainage of the gall bladder through a stab wound. In all

three cases the wound healed without difficulty after a secondary suture, which was done under local anesthesia.

He states, "for many years I have been careful not to make a wound in the middle through the linea alba. In cases where this has been necessary I made a routine practice of overlapping the edges of the linea alba and fastening them together by mattress stitches. Since adopting this procedure I have had no catastrophies."

A. J. Ochsner remarks that he has had several cases of delayed union in non-infected wounds above the umbilicus in patients suffering from severe cachexia due to carcinoma. He does not recall the number of cases he has seen.

Crile has occasionally seen cases of delayed union in non-infected wounds above the umbilicus. In his experience they have usually been associated with anemic or starved patients. The reason for the occurrence in patients of this type he thinks is due to the poor blood supply in this region, even under normal conditions.

Watts writes that he is of the impression that some years ago they had trouble with this condition, but for a long time he does not recall any such cases, possibly due to improved closure.

Judd does not recall a single case of delayed union in a non-infected wound above the umbilicus. He has seen a number of hernias develop in this region, but he thinks that they were due to an atrophy of the rectus muscle, possibly as a result of interference with the nerve supply at the time of operation.

Clark and Willis write that they have not given the subject any special consideration and are unable to make any explanation as to its cause. McGuire has seen no difference in the union of incisions above the umbilicus than in those below, except in cases of drainage or infection.

Haggard and Royster can not recall any such cases in their practice.

O. Madelung has written an exhaustive article on "Post-operative Prolapses of the Abdominal Contents," and gives a detailed report of all cases reported up to 1905. But in this article there is no suggestion that delayed union is peculiarly prone to appear in epigastric wounds; on the contrary, this author explains that this accident is more likely to occur in wounds below the umbilicus. However, when one stops to think that much of Madelung's material came from an early period in abdominal surgery, when the great majority of the so-called abdominal operations were really done for pelvic disease, one is led to disagree with his conclusions. Of Madelung's 156 collected cases, 82 were below the umbilicus. Certainly, in view of the preponderance of subumbilical incisions that obtained at the time this material was furnished, the conclusion that lack of union or imperfect union is more apt to occur in wounds below than in wounds above the umbilicus, is not warranted. On the contrary, the figures go to prove that this accident is more likely to occur in wounds above the umbilicus.

Emil Reis, of Chicago, and R. R. Smith, of Grand Rapids, have both written on the general subject of separation of abdominal wounds, but both of these authors follow the same lines as does Madelung, with the exception that Reis considers only aseptic wounds which have been closed completely. Many others have reported cases of separation of abdominal wounds in general, but none, so far as I know, give any facts of importance not given in the articles referred to. While the evidence is not unanimous, yet it is certainly so nearly so as to leave no doubt but that the conclusion is warranted that epigastric wounds are peculiarly prone to delayed or imperfect union. In this connection, it should be remembered that in a given case the reparative process may be usually slow, and yet no ill effects may follow, provided the suture material holds until the union is perfect; and in another case in which the reparative process is equally good, a hernia or separation of the wound with extrusion of viscera may occur because of absorption of the sutures before the union had been completed.

As to the causes of delayed union in epigastric wounds, it is obvious of course that among them will be found those which are common to all wounds, such as strangulation of tissues from the sutures being tied too tightly, infection, undue tension, and systemic debility. However, if it is admitted that epigastric wounds are peculiarly prone to delayed union, then it must follow that there are causes for this peculiarity. Leaving out of consideration the causes which are common to all wounds, we may sum up the theoretical and known

causes of delayed union more or less peculiar to epigastric wounds as follows:

1. A trophic, or neuro-vascular disturbance, associated with sensory nerve disturbance in the stomach zone of Head.—(Morris' theory).

2. Soiling of the wound with stomach or bowel contents.

3. Tension of the abdominal walls. This tension is of two kinds: constant, from the lateral pull of the abdominal muscles; and intermittent, due to the action of the diaphragm.

4. The anatomy of the abdominal wall peculiar to the epigastric region.

5. Lack of blood supply.

6. Thinness of the abdominal walls.

The treatment naturally resolves itself into the preventive and the curative. The former is of much the greater importance, and it is of this branch of treatment I will speak here. We know of nothing which will in any way modify the neurovascular conditions which may interfere with union, aside perhaps from attention to the general condition of the patient. The deleterious effects of soiling the margins of the wounds with gastric or intestinal secretions should be avoided by protecting the wounds with towels or pads. By making the incision through one of the recti muscles, instead of through the mid line, we may reduce to a minimum the bad effects of tension, anemia, thinness of the wound margins, and the anatomy of the abdominal wall peculiar to this region. However, as has been pointed out by Reis, and demonstrated clinically in many cases, all of these precautions may fail in securing prompt and satisfactory union. We should not lose sight of the fact that no matter how much delayed the union is, it is only necessary to keep the parts in apposition until union has been completed to avoid ulterior results. This means that non-absorbent, non-irritating suture material should be used and allowed to remain until the operator is satisfied that the union is secure. I feel that one is courting serious trouble to remove the non-absorbable sutures under twelve days or two weeks. It means also that in the after treatment all reasonable measures should be used to reduce to a minimum the tension, both continuous and intermittent. Coughing, vomiting, tympany, movements of the patient, etc., all tend to increase the pull on the suture line, thus inducing separation of the coapted surfaces; even though the sutures hold, it is unnecessary to go into detail but it is well perhaps to mention the fact that these deleterious influences can be materially mitigated by the proper selection and giving of the anesthetic, attention to the diet, use of the stomach tube and enemas, giving of sedatives and restricting the patient's movements. In this connection I should like to venture the prophecy that the fashion of getting the patient up early, and the early removal of stitches, will manifest itself, either to us or to our successors, in a harvest of hernias.

Many cases of separation of the wound are reported in the literature wherein the stitches had been removed at the end of a week or ten days, and the patient allowed to get up and exert himself in some such way as to bring unusual strain on the parts. In these reported cases the accident was followed by extrusion of the viscera and immediate repair of the injury, but if the separation, starting at the same time and under the same circumstances, should be incomplete and progress gradually, the patient will later on come to the surgeon with a hernia. For, as has been thoroughly proven by Reis, the separation, when it occurs, always commences in the deeper layers and may be confined to them. An audible snapping occurring in the wound during coughing, sneezing, or other exertion, should lead to a careful examination of the wound and resuturing, if necessary. For the past four or five years we have used silkwormgut through and through sutures in all epigastric wounds, and none of the stitches are removed under fourteen days.

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Discussion.

Dr. R. B. James, Danville: I have got a patient, an old man, upon whom we operated for stricture. We leveled the stricture, but it returned and we cut it again and let out the pus. After that there was no more pus, but the wounds did not heal. I

gave the patient potassium and mercury, and the wound eventually healed.

DR. ARTHUR S. BRINKLEY, (closing): Dr. James' patient must have had some specific trouble or perhaps diabetes.

I recall a case in one of my wards while serving as an interne in a New York hospital. If I remember correctly, this case was an emergency with a mid line incision below the umbilicus. An examination of the urine the next day showed a marked amount of sugar. On the third or fourth day beginning gangrene was noticed, which spread rapidly on either side of the wound. About four inches of the entire abdominal wall sloughed out. When the wound was fairly clean it was resutured with large silver wire sutures, but it immediately broke down again. She went home, and the last time I heard from her was eight months later; the wound then showed no evidence of healing. I don't recall why this case of advanced diabetes was not checked up before operation, but it seemed to slip by, probably because the surgeon did not wait for a urinalysis before operation.

KIDNEY ABSCESS AND PYONEPHROSIS: REVIEW OF CASES.*

By JOHN H. NEFF, M. D., University, Va.

Kidney abscess and pyonephrosis readily lend themselves to a joint clinical review. Both conditions have infection as the prime cause, both result in advanced renal destruction and both usually require nephrectomy for cure. This report is mainly an analysis of the symptomatology and physical findings in a small operative series, nine cases of kidney abscess and twenty-three case of pyonephrosis. The lesion in each instance was unilateral and non-tuberculous.

KIDNEY ABSCESS. Nine cases. The majority of patients were referred without a definite diagnosis. It is instructive, however, that in one the diagnosis has been beginning pneumonia, in another typhoid fever. This failure of preadmission diagnosis is mentioned merely to emphasize the usual absence in these cases of any typical clinical picture. The septic state, in greater or less degree, is, of course, common to all such cases, but evidence to convict the kidney with anything like probable certainty is not customarily obvious. The only features uniformly observed in our series have been pain, tenderness, and temperature.

Pain was never recorded as severe, usually as dull and constant. Most often it has been deep seated in the loin; once diffused over the lower chest, once localized entirely in the so-called gall-bladder region. Tenderness in the costo-vertebral angle was noted eight times. This varied from exquisite sensitiveness to the slightest discomfort upon firm pressure. In one instance, there was no posterior tenderness whatsoever. The temperature was of the septic type and the maximum in the respective cases was from 102° to 105°.

Symptoms had been present three weeks, on the average, before admission, with the extremes five and seventy days. None of our cases presented the fulminant type of renal infection which demands very early recognition to prevent a rapidly fatal outcome. In about half of our cases the onset was quite abrupt, in the others the symptoms developed more slowly.

Four patients had had recurrent chills, and nausea and vomiting were prominent complaints in three. Bladder irritation, other than that commonly seen with a highly concentrated urine, was notable for its absence in all patients save two. One of these was seven months pregnant but with a clean bladder, while the other had a quite marked cystitis probably secondary to the rupture of an abscess into the kidney pelvis.

Six of the nine cases gave a history of factors bearing, no doubt, a more or less direct etiological relation to the renal disease. A large boil preceded by ten days the appearance of kidney symptoms in one case, in another an extensive foot infection two weeks before seemed the causative antecedent. A third patient gave a history of a pleurisy on the opposite side two weeks prior to pain in the flank. Two patients were women six to seven months pregnant and it is possible there was some consequent renal impairment increasing susceptibility to a blood borne infection. The sixth case had been delivered four weeks before the onset of pain.

Six of the cases were females, three males, with the ages varying from eight to forty-five. The right kidney was involved eight times, the left once.

Either perinephritic induration or a palpable enlargement of the kidney was found six times. Most cases had a rather marked secondary anemia upon admission. The leucocyte count varied between nine and twenty-five thousand.

The X-ray examination in a few cases showed a definite increase in the kidney

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shadow, but in the main was of negative value. The few pyelograms which were made demonstrated pelves within the limits of normal as to contour and size.

Seven of the nine cases were cystoscoped. In only one case was the bladder inflamed and this was the only instance where pus was found in the urine from the involved kidney. Another patient with an originally negative urine, abruptly showed much pus and many staphylococci from the diseased side, the sudden change due to the rupture of an abscess into the pelvis as demonstrated at operation.

Ureteral catheterization was most strikingly helpful in making possible the differential estimation of the phenolsulphonephthalein output from the two sides after intravenous injection. Where this test was utilized the alteration of quantitative excretion corresponded quite accurately with the extent of kidney damage. For example, one patient with a pronounced febrile reaction but with few localizing signs, showed the merest trace of the dye from the right side during fifteen minutes, while the opposite kidney put out fifteen per cent. The right kidney was found upon removal to be riddled with countless small abscesses. On the other hand, in another case the normal 'phthalein output was reduced to a little less than one-half and the kidney here proved to have only a solitary abscess of moderate size.

For the whole series the preoperative diagnosis was correctly made seven times. One case was explored the day of admission without the usual study. The remaining case was mistakenly diagnosed empyema of the gall-bladder. This error had for its basis a history of pain having begun under the right scapula and breast, the palpation of a rounded tender mass just below the edge of a low liver and the absence of either tenderness or a mass posteriorly. A routine cystoscopic examination gave negative findings, but, to our later chagrin, a preconceived diagnosis led to the omission of a functional test. Certainty of diagnosis lay in the estimation of 'phthalein excretion and the instance serves to stress the importance of functional study whenever there is any possibility of renal abscess.

A lumbar nephrectomy was done in eight of the nine cases. In the other case, an abscess about an inch in diameter and just beneath the capsule was found near the upper pole. In spite of extensive oedema of the perirenal fat, the remainder of the kidney seemed normal. The 'phthalein output for fifteen minutes had previously been found to be six per cent. With considerable trepidation, the grossly involved portion of the kidney was removed and the wound later Dakinized. The patient made a good recovery and reports that there has been no trouble in the two years since operation.

From the viewpoint of technique, the subcapsular method of performing a nephrectomy has frequently proven most helpful, particularly in the avoidance of possible damage to adjacent structures that could not be recognized because of the extensive perirenal induration.

Six of the removed kidneys were either studded throughout with innumerable small abscesses or else were practically destroyed by several large abscesses. Two specimens, however, showed solitary abscesses of relatively small size involving one or the other pole while the remainder of the kidney presented no other infarcts on gross section. It is quite possible that in these two instances a partial nephrectomy might well have preserved kidneys of diminished but quite useful functional value. In the presence of a demonstrated abscess, however, the decision to do anything short of a nephrectomy is a difficult one to make, particularly if one thinks forward to a possible secondary nephrectomy under trying circumstances.

Recovery was uneventful in these nine cases save for a temporary colonic fistula in one instance. The average stay in the hospital after operation was thirty-seven days.

Pyonephrosis. Twenty-three cases. The outstanding feature for this group has been the long duration of symptoms before admission to the hospital. The average period has been eight years, the upper extreme twenty-three years, and only three cases of the series had had symptoms for less than one year. The symptomatology much more frequently suggested at once a renal lesion, of course, than with the abscess cases and the urine in every instance was pus laden. Yet, one case had been diagnosed as malaria, another as typhoid fever.

The most constant complaint has been re-

current pain in the kidney region, front and back, usually with chills, always with temperature. In about a third of the cases, the pain has been very severe and with the customary radiation of text book renal colic. A few patients gave a history of very slight pain and little or no temperature. Marked bladder irritation was recorded for only one-half the group, while a goodly number denied frequency or dysuria. On the other hand, two patients had for their only complaint extreme frequency and urgency of urination of long standing.

There was neither tenderness in the renal region nor could the kidney be felt in six cases. The only abdominal sign present in one-half the cases was greater or less local tenderness. A palpably enlarged and tender kidney was made out in six instances. A renal fistula was present in two cases, a ureteral fitula in another—all dating back to previous operations.

X-ray examination demonstrated stones in the kidney or ureter, or both, in eleven of the twenty-three cases and for a small percentage visualized quite clearly an enlarged kidney.

The youngest patient was twenty-three, the oldest fifty-three, the lesion was on the right side nine times, on the left fourteen. Twelve cases were in men, eleven in women.

Cystoscopy was performed in twenty-one of the twenty-three cases. In only two cases was there an extensive ulcerative cystitis. The inflammatory bladder changes on the whole were surprisingly slight in view of the prolonged outpouring of purulent urine from above. A rather mild basal cystitis with more intense injection and oedema about the ureteral orifice corresponding to the involved kidney was the usual picture. Most times a glimpse at the ureteral orifices made the diagnosis, a clear sparkling efflux on the one side, the intermittent emission of a solid pus strand on the other. Pus in the urine from the uninvolved kidney was found only once, in that instance four to six cells to the high power field in the centrifugalized sediment.

Frequently where ureteral meatoscopy had indicated a worthless kidney on the one side, the two-hour bladder collection of 'phthalein was accepted as representing the output from the non-infected side. The dye, so recovered, varied from fifteen per cent. to sixty-five per cent., the average was thirty-nine per cent. In the cases where the differential estimation was done by ureteral catheterization after intravenous injection, the average fifteen minute collection from the good kidney was twenty per cent., seven and one-half per cent. to thirty per cent., from the pyonephrotic kidney, a trace too faint for reading.

Where pyelograms were made, the pelvic deformity usually appeared as one of two types. One form was large, sacular dilatation with rounded, blunted calyces, the hydronephrotic picture, the other was that of disintegration and moderate dilatation, little or no resemblance to the normal contour remaining.

The original kidney lesion in most of these cases could not be determined with certainty. It seemed fairly clear that some had started as a pyelonephritis, others as a kidney abscess, in still others that there had been primarily a stone or other form of obstruction with subsequent infection. Seven of the twenty-three cases had had for two or more years at the outset recurrent attacks of renal colic without chills or temperature and the operative specimens in some instances obviously indicated a primary hydronephrosis and secondary infection. Earlier surgical interference in such cases might well have relieved symptoms without loss of the kidney. Calculi were present in eleven cases, varying from a single giant calculus to numerous small stones in the kidney or ureter. We are unable to say how many of these stones were primary and how many secondary. One patient was four months pregnant at the first onset of symptoms, another two months pregnant, two had been delivered shortly prior to their first kidney symptoms.

The preoperative diagnosis in this series was pyonephrosis twenty-one times, multiple renal calculi once, and cystic tumor of the kidney once. The latter case is of sufficient interest to warrant recording in brief detail.

For a month before admission, this patient had had a constant "drawing sensation" in the epigastrium and upper right abdomen, associated with irregular nausea and vomiting, and probably with a very low grade temperature. He lost weight and strength rather rapidly but remained at work most of the time. A large right sided mass was first found by his

physician and upon admission this obviously fluctuant, rather fixed mass reached below the level of the umbilicus and well around in the flank. Coincident with the onset of this illness some frequency of urination developed and the urine was often cloudy. Previous urinary disturbance was denied. Upon admission, there was a frankly purulent urethral discharge and many gonococci were demonstrated in smears. For this reason cystoscopy was omitted. At operation the condition proved to be a tremendous pyonephrosis and gonococci and no other bacteria were shown by smears and cultures from the contained pus.

A nephrectomy without preliminary drainage was done in all cases. The operative specimens were usually mere pus shells. Where much kidney tissue remained, this was sclerotic and in sections showed diffuse inflammation and often microscopic abscesses.

There was one death in the series. This fatality was directly attributable to undue hemorrhage during operation.

Conclusions.

1. Tenderness or pain in the kidney region, associated with temperature and without other evidence of kidney infection, demand complete urological study. In this study the estimation of renal function should always be included.

2. An ocasional kidney abscess may be successfully handled by a partial nephectomy or drainage.

3. A pus laden urine may be practically the only clinical evidence of pyonephrosis.

4. The loss of many kidneys could be avoided by earlier surgical attention to obstructing conditions in the pelvis or ureter.

Discussion.

Dr. Julian Rawls, Norfolk: Some little time ago I saw a case which gave the history of having had for several years attacks of pain in the region of the right kidney accompanied by the development of a mass in that location. I had occasion to cystoscope him twice following a subsidence of the acute attack and the disappearance of the mass. In each instance I had no difficulty in getting a catheter all the way to the kidney on that side and each time that kidney was functionally almost as good as the left kidney. Dr. Neff saw this man in an acute attack and was unable to get the catheter to the kidney. He then returned to Norfolk and I made an unsuccessful attempt to catheterize that kidney.

Later, he went back to Dr. Neff who succeeded in obtaining a pyelogram. I think he said that the picture showed some hydronephrosis. The kidney function was practically nil.

This man had about made up his mind to have a nephrectomy done when he was persuaded to go to Baltimore to see Dr. Geraghty. It happend that Geraghty saw him after the acute symptoms had entirely subsided and there had been some return of function to the damaged kidney. He advised against nephrectomy and performed some type of reconstruction operation with a suspension. The man has had no further trouble, is in good health and has been gaining in weight.

In some of these cases the kidney often goes dead but eventually a good deal of its function returns after the obstruction has been relieved.

Dr. Arthur S. Brinkley, Richmond: About six months ago we had a case of perinephritic abscess, brought into the hospital acutely ill, giving a history of having been sick four or five days. There was a mass under the right costal arch about the size of a small orange. The patient's respiration was bad, and he showed all of the symptoms of an acute infectious condition. His pulse was 160. with a temperature of 103. Abdomen was rigid and distended.

Under ether anesthesia, a right lumbar incision was made, and with the index finger the abscessed cavity was ruptured. The abscess extended toward the upper pole of the kidney. Three or four ounces of a dark, grumous looking pus was liberated. It had the appearance of a streptococcic infection. Examination showed a hemolytic streptococcic infection.

The patient was desperately ill for ten days, requiring gastric lavage every four hours for twelve days, and active supportive treatment. He recovered, and today is in good condition.

I would like to have Dr. Neff discuss any such cases he may have had.

Dr. John H. Neff, University (closing): The man to whom Dr. Rawls referred had a large mass in the upper right abdomen when we first saw him. We could not get the ureteral cathter into the pelvis on this side and hence obtained no flow. The 'phthalein output from the left kidney was twenty-two per cent. in fifteen minutes. Some months later we demonstrated a large hydronephrosis on the right side, but there was practically no 'phthalein recovered from the kidney, while the output on the left side was again twenty-two per cent. We advised a right nephectomy.

This patient later consulted Dr. Geraghty who, on the basis of a rather good urea output from the right kidney, advised a plastic operation with preservation of the kidney and this was done.

Dr. Brinkley's case was very interesting. We have had no experience with this type of infection and hence I feel unable to discuss his case.

PROSTATECTOMY, WITH SPECIAL REFERENCE TO THE PERINEAL ROUTE.*

By J. SHELTON HORSLEY, M. D., Richmond, Va.

The best method of relieving the effects of an hypertrophied prostate cannot yet be said to be strictly standardized, but the situation is nothing like so chaotic as it was ten years ago. The chief cause for the improvement in the

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treatment of prostatic patients has been a more accurate study of the renal function. This has been the outcome of the combined efforts of the physiologist, the biochemist and the clinician. Phenolsulphonephthalein has added greatly to the methods of determining renal function, but perhaps the most accurate test is the determination of the blood urea nitrogen. A practical and very reliable method is a modified Mosenthal test for the elimination of salt by the kidneys. This latter test requires no special apparatus and can be employed by any practitioner who has the simplest laboratory outfit for examining urine. (Dodson and Ashworth, "The Diagnostic Value of Analysis of the Urine," *Va. Med. Monthly*, April, 1922).

Prostatic obstruction that causes a constant residual urine of three or four ounces is almost certain sooner or later to give serious trouble, even though the early symptoms of such slight obstruction may be very mild. The back pressure upon the kidneys, and the infection that often follows the stasis add to the gravity of the situation. The sudden relief of this pressure is sometimes serious, so that patients who have had complete retention or a marked amount of residual urine should be treated cautiously in the emptying of the bladder, in order that the kidneys may gradually resume normal work without the handicap of the back pressure to which they have become accustomed. The methods for accomplishing this by catheterizing part of the urine or, better still, by emptying the bladder and introducing boric acid solution, are well known. After a few days of such treatment it is safe to empty the bladder completely.

In the prostatic patient whose bladder has not been infected, the results of any operation or of continuous drainage are often complicated by an infection that is more serious than in the patient whose bladder has been infected. For this reason, when the urine is perfectly clear, great care should be taken to avoid infection and, while the promiscuous use of vaccines is unwise, in these cases a few doses of a general combined vaccine treatment is often helpful before attempting to do any operation upon the bladder.

Since December 1, 1919, when Dr. A. I. Dodson became associated with the work at St. Elizabeth's Hospital as urologist, our management of prostatic cases has been much more satisfactory. He has worked out the method of treatment of patients with hypertrophied prostate before and after prostatectomy. (Dodson, "Prostatectomy, a Report of Cases, with Special Reference to Pre-Operative and Post-Operative Treatment," *Va. Med. Monthly*, Dec., 1922.) During this time, from December 1, 1919, to the present, I have done seventeen prostatectomies. There has been one death, and that was from an error which I believe will not be repeated. This case, an early one in the series, was first drained as usual by suprapublic cystotomy done under local anesthesia. After his condition became satisfactory, which was about two weeks after the drainage operation, I did under ether a suprapubic prostatectomy, enlarging with the finger the former suprapubic opening. The bladder was given the usual treatment of irrigation with boric acid, and then argyrol, just before operation. After removing the prostate, I found that the peritoneum had been torn open in a small place at the upper portion of the wound. This was sutured. The patient developed high fever within the first twenty-four hours, and his temperature reached 105 axillary. He died on the following day after operation. Necropsy showed a small amount of bloody serum in the peritoneal cavity. There was not much local tissue reaction, but there was apparently a virulent rapid peritonitis. Since this experience I have done fewer suprapubic prostatectomies, though I think this route has a very definite place in operations on the prostate gland. When it is necessary to do a suprapubic prostatectomy, I now enlarge the suprapubic drainage opening by an incision down toward the pubis, and mobilize the tissues in this direction so as to prevent them from tearing upward into the peritoneum.

Of the total number of cases, we have done eleven by the suprapubic route (mostly in the first part of this series) and six by the perineal route. Included in this group are two cases in which the prostate was cancerous. In one the cancer was quite extensive, and all of the tissue could not be removed. This patient was operated upon by the suprapubic route. A diagnosis of cancer was not made until the operation was performed. There was a moderate amount of hemorrhage, he was badly shocked, and was transfused by the direct

method a few hours after operation. He made a satisfactory immediate recovery, and three days after the operation radium was applied directly to the wound in the bladder. Sixty milligrams of radium were placed in the bed of the prostate through the bladder and left seventeen hours. The reaction from the radium was exceedingly severe, but this patient, who was operated upon May 26, 1921, has made a satisfactory recovery and is apparently free from any recurrence. His present general condition is excellent.

The other case of cancer was not so extensive. In this patient, too, cancer was not recognized until at operation. The prostate at one point was firm and had infiltrated the capsule around it rather markedly. The prostate was removed, and a frozen section made while the patient was under anesthetic showed cancer. Sixty milligrams of radium were then applied in needles around the capsule of the prostate. This patient also had marked shock, and was transfused four hours after operation. He recovered and, while apparently there is no recurrence of the cancer, there is a considerable degree of incontinence. He can control the urine during the night and while sitting down, but there is very little control while standing or walking. This is the only patient in whom there is any degree of incontinence, and I think it is due not only to the somewhat more extensive operation on account of cancer, but to tissue changes from the direct application of radium. I believe the incontinence will improve.

At present I do most of the prostatectomies through the perineal route, using the technic of H. H. Young. In many of the cases there is some variation of this technic, which is suited to the individual requirements. It is necessary to remove the obstruction in the median portion of the capsule. With the finger within the capsule after the lateral lobes have been enucleated, a growth in this region can be palpated between the prostatic tractor and the finger, the tractor being manipulated so that any possible obstruction can be felt with the finger. The finger is always introduced into the bladder before the tractor is inserted, or after it is removed. This is to insure not only the removal of obstruction, but to be certain that there is no stone.

Our routine procedure now for prostatic patients is, first of all, to ascertain their renal function by phenolsulphonephthalein, and the blood urea nitrogen, in addition to the regular methods of examination of the urine. The amount of retention is measured. If it is very large, the patient's bladder is emptied in stages. Then a suprapubic operation is done under local anesthesia. The opening is made large enough to introduce the finger. In this way the outline of the interior of the bladder and of the prostate. as well as the consistency of the prostate and its general direction of growth, are obtained. We do not feel that it is wise as a rule to cystoscope prostatic patients. Dr. Dodson and I feel that better information may be obtained with less risk to the patient by a suprapubic opening, which is also necessary for drainage.

We have not found that continuous urethral drainage is satisfactory. It is often painful and difficult to maintain, and has a tendency to promote urethritis. After the exploration through the suprapubic cystotomy, a mushroom catheter is inserted, and the bladder wall is sutured snugly around the catheter to make the union watertight. The abdominal wound is partially closed with interrupted sutures of silkwormgut, and a strip of idoform gauze is carried down to the prevesical space. This operation can be done with no pain under local anesthesia, though the exploration of the bladder with the finger, which only requires a short time, gives some discomfort.

Often mild symptoms of uremia develop during the first few days after establishing this drainage. When these symptoms have disappeared, and when the blood urea nitrogen, phenolsulphonephthalein and the general condition of the patient (which also includes the appearance of his tongue) seem to show him to be about normal, prostatectomy is done. If the previous suprapubic exploration has shown that the growth lies chiefly in the bladder, and particularly if it is pedunculated, the suprapubic route is employed. These cases, however, are exceptions. In other instances, especially if we suspect malignancy, the perineal route is followed.

While the perineal route requires a little more time than the suprapubic, there is less likelihood of infection. There is better control of hemorrhage by packing of the cavities from which the prostate is removed, and the patient is, I think, more comfortable. The prostate should be removed as gently as pos-

sible so as to leave a pocket into which gauze can be packed. If the bladder is widely torn, or the tissues are damaged extensively, naturally the risk of the perineal method is greatly increased.

It would be strange not to find a few patients among men of this age who suffer shock from such an operation. It is always wise to have donors matched up for direct transfusion of blood after prostatectomy. In this series we have used post-operative transfusion for shock three times, twice in cancer cases and once in a very large prostate in a man whose condition was none too good, but apparently could not be made better. I think it probable that without transfusion all three of these patients would have died.

Each prostatic patient has to be studied on his own merits. With the careful cooperation of a skilful urologist and a competent surgeon, the mortality should be small, and the morbidity should be very little. By recognizing the necessity for the establishment of a maximum amount of renal function, by doing the operation with as little trauma as possible, by promptly using transfusion, which is almost a specific in shock or hemorrhage, and by selection of the method of operation best suited for each case, the mortality in these prostatic patients can be reduced to its lowest terms.

St. Elizabeth's Hospital.

DISCUSSION.

DR. H. H. TROUT, Roanoke: Am particularly interested in prostatectomies from the standpoint of the operative use of radium. We have had in the last four years, six cases of cancer of the prostate, in which we implanted radium after doing a suprapubic prostatectomy. Our method has been to use a number of small needles spread over a large area so as to obtain the beneficial effects well distributed. Our results with radium have been such as to lead us to hope it would be of great benefit as an adjunct to surgery, in what is, so far, an almost hopeless procedure. One of the six cases is well over a period of three years, one over a period of eighteen months, two for three months and two died before leaving the hospital.

DR. J. H. NEFF, University: In spite of the fact that we do about half of our cases suprapubically, we are rather partial to the perineal prostatectomy. Of late we have been following the technique of Geraghty's modification of Young's operation, and so far have found it very satisfactory. The enucleation by this method is clean and complete and the likelihood of post-operative incontinence is greatly lessened since the membranous urethra is not opened.

Without having the actual figures at hand, I think I can safely say that catheter drainage has been quite satisfactory in the preliminary treatment of 70 to 80% of our cases. A suprapubic cystostomy is usually only done when catheter drainage has been a failure for one reason or another. In our experience suprapubic cystostomy has not been the simple innocuous procedure that the literature sometimes leads one to believe.

DR. J. SHELTON HORSLEY, Richmond (closing): In the seventeen cases here reported, which comprise all of the prostatectomies done in St. Elizabeth's Hospital since association with Dr. Dodson as urologist, eleven of them have been by the suprapubic method, but they were almost entirely in the earlier part of the series. More recently we are using the perineal method, and like it as a rule much better. There is unquestionably room for both methods. I was much interested in hearing what Dr. Neff had to say about the Geraghty method. The only instance in which we have had any trouble from incontinence in patients operated upon by the perineal route was in a case of cancer, in which it was necessary to do a very extensive operation and then to insert radium after the operation. The patient has now a partial incontinence, and can control the urine while sitting or lying, but not while walking about.

Two of these prostatectomies have been cancer cases, and in both instances we have applied radium directly into the wound. At present both patients are apparently free from recurrence.

In using transfusion, I particularly wish to impress the importance of doing the transfusion promptly, and by the direct method. We have had about fifty direct transfusions without any reaction.

SOME FURTHER OBSERVATIONS ON PROSTATECTOMY.*

By ROBERT C. BRYAN, M. D., F. A. C. S., Richmond, Va.

In April, 1921, the writer reported one hundred consecutive prostatectomies, making observations at that time upon the physical state, the character of the urine, cystoscopic examination, the general findings, and entered into detail, by the use of lantern slides, about the process of enucleation of the prostrate gland by the Bentley-Squier intra-urethral method, paying particular attention to the sequences of the operation in combating hemorrhage, shock and postoperative complications.

It was stated in this paper that thirteen cases had the suprapubic cystostomy carried out under novocaine, the extreme disability being such that the patient never came to the ultimate enucleation of the gland. Eleven cases were lost following prostatectomy which were tabulated as follows:

Hypostatic pneumonia	1
Apoplexy (during anesthesia)	1
Acute dilatation of the heart on sitting up	1
Septic endocarditis	1
Infection on removal of Hagner bag	1
Uremia	2
Hemorrhage	3
Anuria	1

*Read by title at the fifty-third annual meeting of the Medical Society of Virginia in Norfolk, October 31-November 3, 1922.

In consideration of the causes of death we have learned by further experiences to reduce the mortality by even greater precautions, and in the last year there have been twenty-nine prostatectomies, no cases having been lost from hemorrhage, which was the cause of the death in three of our cases last reported.

Previously the average age of the patients was 65, in this series 69; the renal efficiency by the phenolsulphonephthalein method, taken in every instance, has proved to be 23.2%, the lowest 7%, the highest 70%. The case of 7% renal efficiency, operated on for acute retention under novocaine, by persistant proctoclysis and water drinking developed 17% on the date of the operation, the old man making ultimately an uneventful convalescence and going home. The encouragement of water drinking and water absorption either by the bowel or saline intravenously has, we believe, been the means of saving several lives, certainly increasing the renal output to a point which justifies operation.

In three of this series suprapubic cystostomy alone was performed for acute retention, the condition proving to be inoperable carcinoma. In all of these cases the radium needle was used, plunging it deep into the prostatic substance through the suprapubic opening. On an average of 50 mgr. from twelve to fourteen hours was used in each case. The writer has seen no abscess formation or urinary infiltration following the use of this method, but in one instance the replacement fibrosis was of such a dense character that the suprapubic wound ultimately healing required external urethrotomy for severance of the scar tissue about the internal sphincter. This old man, operated upon some sixteen months ago, is apparently in good health and, although a slight suprapubic drainage is still going on, he is able to be about and has no pain.

The blood urea, nitrogen and creatinin has only been done in those cases where the contamination of the urine by the blood was so great that the pthalein test would have been unrecognizable. The writer does not attach the significance to this index of urinary balance that we do to the pthalein test.

Of the three deaths that were sustained in this recent series of prostatectomies one died thirty days following the operation, when the wound had healed; he was up and walking about, but developed a deep cold which rapidly went on to pneumonia and death from cardiac failure in 48 hours. The second case died six weeks following the enucleation from general debility and refusal to take nourishment and drink water, the tissues being so dehydrated that the urinary output was practically nil. The third case was apparently the only one in whom we could probably have avoided death, which occurred the day of the operation. This was an error of surgical judgment. He had been prepared for weeks for the operation by proctoclysis and water drinking, his pthalein raised to justify the procedure, but sufficient care was not given to his heart which, from the strain of nitrous oxide anesthesia, developed acute cardiac dilatation a few hours following the operation. It has been our custom to have the opinion of a medical man to pass upon the character of the heart sounds, although it has been noted that the turbulent skipping heart from urinary retention tends to a restitution by quiet and relief by the suprapubic drainage.

A further analysis of our records indicates that the average time elapsing between the operation under novocaine and the second operation under nitrous oxide was twenty-three days, and the average length of time in the hospital five weeks. Only in a few instances has the suprapubic drainage continued on leaving the hospital, the patients feeling so well they insisted upon returning home to be under the care of their family physicians. It has been noted that those patients, following the removal of the gland, who remain quiet and allow the wound to heal slowly but surely, do the best. Attempting to force its union by moving around, sitting up in bed too soon, or getting up in a chair, throws an unnecessary strain upon the healing tissues which tends to delay the union.

Two cases which may be referred to in particular are those of extreme urinary retention; the one had a residuum of twenty-two ounces, the other thirty-three ounces. Both of these gentlemen, age about 55 years, had been treated for heart trouble and other obscure medical conditions without any apparent betterment. Their improvement in health and strength on the removal of the gland was most gratifying. One of them had a clean bladder, the other two large diverticulae the size of a turkey's

egg for which it was considered unwise to do anything at the time of the prostatectomy. This latter patient has had on two occasions since the operation a pretty sharp hemorrhage which the writer takes to be due entirely to the diverticulae.

One sequence which had not been observed in our former report of cases is cicatrization or thickening of the internal sphincter following the removal of the prostate. This at times has been pronounced, requiring forcible dilatation with the Kohlmann dilator or the use of sounds. Young says:

"Normally the internal sphincter is composed of small non-striated delicate fibres grouped into bundles separated by a thin layer of connective tissue. As the examination is carried closer to the mucous membrane, the muscle structures become smaller and are separated by thicker layers of connective tissue until the submucosa is reached, where there is practically no muscle. Contrasted with this, the contractures show the sphincter to be composed of coarse muscle fibres grouped into large bundles separated by the smallest amount of connective tissue and lying much closer to the mucous membrane."

Chetwood says that there is a chronic inflammation with secondary fibrotic contraction producing sometimes total occlusion with elevation of the opening about the floor of the prostatic urethra, and that the inflammation involves the periurethral glands and is accompanied by round cell infiltration into the tissues between the glands and invades the sphincter muscles. The mucosa becomes hypertrophied and polypoid. It must be realized at this time that the condition of contracture of the neck of the bladder is not always found single-handed, but not infrequently arises with moderate enlargement of the prostate.

All cases of prostatectomy should report within a couple of months for a thorough investigation of the prostatic urethra and the condition of the urine. Evidences of sphincteric cicatrization are noted early in a much-delayed union of the suprapubic wound. Just at present an old man 76, whose prostate was removed in July, still returns at intervals for dilatation of the internal sphincter and irrigation of the bladder.

The writer can hardly emphasize too strongly the importance of a thorough instrumental (sounds and cystoscope) examination of those cases whose ventral wound continues to drain for six to eight weeks following prostatectomy. The urine may become fetid and infected and an ultimate pyelitis or surgical kidney is in order. We cannot disregard the stenosing, cicatricial internal sphincter, which for years held apart by the enlarging prostate has now no intervention to prevent it contracting down to a degree which demands relief by gradual dilatation. This treatment should not be instituted until there has been a thorough healing of the prostatic urethra, which on the average takes about one month.

In this, our second series of cases, that distressing complication, epididymitis following prostatectomy, has not been noted. This is not due to any greater preoperative care than formerly, but following the operation the scrotum is kept elevated and the patient is encouraged to use a suspensory bandage on leaving the hospital.

In conclusion, the writer would call particular attention to prolonged bladder drainage, copious water drinking and persistent proteclysis as the most desirable adjuncts to a happy outcome of an operation, which at best has to deal with the elderly and must, therefore, be attended with considerable surgical risk.

Grace Hospital.

MULTIPLE MYELOMA WITH REPORT OF THE CASE.*

By JULIAN L. RAWLS, M. D., Norfolk, Va.

Multiple myeloma is a condition of sufficient rarity to justify the reporting of all cases, in order that the accumulated data may be of some benefit in arriving at a conclusion as to its etiology.

Ewing's definition is, that "Multiple myeloma is a specific malignant tumor of the bone marrow arising probably from a single cell type and characterized chiefly by multiple foci of origin, a uniform and specific structure composed of plasma cells or their derivatives, rare metastasis, an albuminuria, and a fatal termination." He further states, that this description is subject to extensive modification.

The text books on surgery have used indiscriminately the term myeloma for what we ordinarily understand as the benign giant cell sarcoma and the condition which we are discussing in this case; for instance, Warbasse

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states that a myeloma is a benign tumor of the red bone marrow treated by excision and curettement or by curettement alone. Keen's Surgery, Vol. I., p. 148, states that myeloma are non-malignant tumors of red bone marrow rarely seen after the twenty-fifth year and if removed before the tumor tissue perforates the capsule, they do not recur. In Vol. II., p. 71, under the same name, it is referred to as a rare malignant tumor of the bone.

In Vol. III., p. 58, they refer to the condition under the term myeloma, Kahler's disease, as a condition which in the present state of our knowledge is absolutely incurable. So it would seem that even the same authority uses the term indiscriminately.

The condition is of unknown etiology, it is characterized by the appearance in one or more bones of a peculiar type of tumor growth, which shows no tendency to new bone formation and which rarely metastisizes in lungs, liver or other internal organs.

The sites of predilection are the sternum, ribs and skull, more rarely in long bones and in the vertebral column.

It is usually accompanied by Bence-Jones proteids in the urine—a peculiar type of albumin which appears in the urine on heating and disappears when brought to 80 degrees centigrade, and reappears on cooling.

Wattes, of the Mayo Clinic, says that Bence-Jones proteinuria is significant from a diagnostic and prognostic standpoint, since it occurs in 80% of all cases and is usually followed by death within two years.

Nichols, in a recent article on "The Roentgen Diagnosis in Tumors of Long Bones," refers to myeloma as a true bone tumor, medullary in origin, showing an elevation of the cortex, erosion and protrusion of the growth. He states that the X-ray examination should first give the appearance of expansion and later of destruction to the cortex.

With this very brief description I wish to report the history of a case of myeloma which came under our observation.

Avel Copeland, colored, female, aged 37 years, married twenty-one years.

Family History. Father dead, cause unknown. Mother died at forty-five of pulmonary tuberculosis. One brother twenty-five years of age, good health. No sisters.

Past History. Pertussis and measles as a child. Malaria thirteen years ago; was sick for over two months. No other illness, no accidents, no operation. Menses at fourteen years; irregular until her marriage, no pain, lasted three or four days. Married at seventeen years. Ten full term pregnancies. No miscarriages. Last pregnancy terminated in April, 1921, and the baby developed hydrocephalus after birth and lived three months. Menses are regular at the present time and without pain. She has no leucorrhoea at present time but did have a slight discharge two weeks ago.

Present Complaint. In January, 1921, she had a pain in the left side of her back, but it was not severe enough to cause her to go to bed. This continued until after her baby was born in April, then it disappeared for two weeks, after which it returned and she has had some discomfort ever since. It became worse about three months ago and she went to bed for a month. She had some vomiting but none before or since. She was up for a month and then had to go back to bed. She has been in bed ever since. She states that she has a discomfort (or a "fluttering") in her abdomen. She has had no edema of her limbs since her confinement.

She has had no shortness of breath or headaches. She had some disturbance of vision after her last delivery in April but that has cleared up. She claims that she has had some pain and some disturbance in her right leg in walking since her illness in September. This pain is worse at night and once or twice when walking the leg has given way.

Physical Examination. *Head* negative. Pupils react to light and distance. Ocular movements normal. Teeth in good condition. Tongue coated but moist. *Neck* negative. Thyroid not enlarged. No adenopathy. *Chest* negative. Mammary glands normal. Heart and lungs normal. Blood pressure 130/80.

Abdomen. No distention; no marked rigidity. There is a sense of resistance and tenderness around the left kidney region but the kidney is not distinctly palpable. Right kidney negative. Liver is not enlarged. Both kidney areas are somewhat tender on first percussion over back. Spine normal. *Limbs* are negative. No varicosities or ulcers. No edema. No nodules felt. The left patella reflex is more active than the right. There are no abnormal reflexes.

Pelvic examination is negative.

Urinalysis. December 26, 1921. Catheterized specimen. Amber; clear; acid; 1010; albumen trace; sugar none.

Microscopic. Hyalin and granular casts; small amount of epithelium; large number of pus cells; few blood cells.

Cystoscopic. December 27, 1921. Bladder shows no marked congestion. No intolerance to fluids. Both ureteral orifices are normal in appearance and catheterize easily. No stricture. Both kidneys are functionating normally. Phthalein appeared through both kidneys in seven minutes.

Right kidney specimen shows a few epithelial cells; left kidney specimen—a large amount of epithelium, a small amount of pus, and a few pus casts and granular casts.

X-ray of her genito-urinary tract was negative. A Wassermann made December 31st, 1921, was negative.

Diagnosis. Left pyelo-nephritis.

On January 5th, while still in the hospital, the patient sustained a pathological fracture in the upper third of the right femur, while her position was being adjusted in bed. She had not borne her weight on that limb in over three weeks. The x-ray showed a destruction of bone at this point with an internal rotation of the lower fragment with a shell completely broken off from the outer surface. There was no expansion of the thin cortical shell. There was apparently no invasion of the soft tissues.

On January 7th, Bence-Jones bodies were present in the urine. Her blood picture at that time was Hg. 77%; R. B. C. 4,250,000; W. B. C. 13,200; Small Lymph. 13%; Large Lymph. 2%; Mono. 5%; Trans. 5%; Poly. N. 74%; Baso. 1%.

X-ray of her sternum and ribs was negative. Also a pyelogram of her left kidney showed no evidence of irregularity. The plates were sent to Dr. Bloodgood with a request for an opinion on the lesion.

Dr. Bloodgood came to Norfolk in February and saw the case. He suggested the application of a plaster cast supportive treatment and repeated X-ray plates to determine the condition. He stated that if it were myeloma the condition was hopeless; that if it were medullary sarcoma she probably would not survive a hip joint amputation; and if it were a bone cyst there was no need for precipitate action. We made repeated attempts to check up the finding of the Bence-Jones proteid, but the laboratory technician reported that there was so much of the ordinary albumin in the specimen that it was impossible for her to detect it.

Shortly after this patient developed a facial erysipelas and was transferred to the City contagious hospital for treatment. Recalling the action of Coley serum and the treatment of malignant growths with streptococcic toxins, we were in hope the erysipelas might have some beneficial action on the growth.

She was returned to the Norfolk Protestant hospital still in a cast, and an X-ray plate taken on February 22nd, showed a further extension of the disease process up the shaft.

In March her husband died in another hospital, of septic pericarditis, and on her urgent request she was sent home in the cast in order to be with her little children. This was several miles in the country and I placed her under the care of a colored physician who promised to keep me informed of her condition.

I saw her by accident in the latter part of April and found her acutely ill. There had been a marked emaciation, she had a high fever and rapid pulse and was coughing almost constantly. She died the following day before I could have her readmitted to the hospital, and an autopsy showed the abdomen entirely free of any pathology. Neither kidney showed any gross pathology. The liver was slightly enlarged but contained no nodules. The heart was normal. Both lungs showed a hyperstatic congestion and there was a hard nodule in the posterior portion of the right lung which I took to be a metastasis. The entire tumor of the femur and a section of the lung were sent to Dr. Bloodgood's laboratory and he very kindly sent me the following report: The section from the lung shows no metastasis but sections from the tumor all show groups of cells found in multiple myeloma, plasma cells, various forms of leucocytes, marrow cells and nucleated reds.

I think, then, we are safe in considering this a case of multiple myeloma, although but one bone showed evidence of the growth at the time of her death and that a long bone.

142 *Main Street.*

AN UNUSUAL CASE OF MASTOIDITIS.
Operation and Recovery.*

By THOS. E. HUGHES, M. D., Richmond, Va.

Patient, R. C. W. Jr., a school boy, thirteen years old, somewhat frail looking, was seen first during present illness, September 7, 1922.

COMPLAINT.—Swelling behind right ear.

F. H.—Unimportant. No tuberculosis; no syphilis; no ear trouble.

P. H.—No illness except similar swelling over same mastoid in February, 1921. At this time several members of the family had influenza, which, however, this patient escaped. He developed slight pain in the right ear and several days later a swelling appeared over mastoid. The patient thinks there was a slight discharge from the canal, but not enough for irrigation. There was no acute pain in the ear nor in the mastoid. Swelling lasted for several weeks, but gradually subsided without operation. As I did not see the patient during this attack, I cannot give you the condition of the ear drum; but Dr. Talley's history and X-ray findings of the case are as follows:

"February 15, 1921, patient has had some swelling over the mastoid region for the past week, which has gradually increased, has slight pain, very little tenderness on pressure. No discharge from the ear. Had some temperature, as high as 103 F. Left mastoid of pneumatic type development fairly good for patient of this age. Right mastoid shows evidence of cell destruction in lower portion with general decrease in density."

CONCLUSION: "The findings indicate a considerable amount of disease in the right mastoid."

X-ray Report No. 2—February 21, 1921, shows:

"No evidence of any increase in the changes reported in the right mastoid are observed at this time. The X-ray appearance is essentially the same as before."

CONCLUSIONS: "The findings indicate that no increase in the process has taken place. A subsiding process would not necessarily give an alteration in the appearance of the plates. Therefore, it is perfectly possible that the conditions may be improving."

Patient has been quite well since this attack, except when tonsils and adenoids were removed, July, 1921.

P. I. Patient was seen September 7, 1922, and said that swelling behind the ear was first noticed the night before. There had been slight discomfort behind the ear for several weeks, but not sufficient to make him complain of it to his family. No pain in the ear and no discharge at any time from the middle ear. No furunculosis. No infection in the nose, throat nor sinuses.

Examination revealed swelling over the mastoid tip, which extended slightly behind and below; some tenderness over tip, but none over mastoid antrum; no swelling about the auricle nor in the external auditory canal. The membrana tympani was normal in appearance except for very slight injection in Shrapnell's membrane. No bulging; light reflex present. The appearance of the drum did not change during the course of the disease. The hearing was only slightly impaired. Weber lateralized to the right. The patient was seen daily and swelling gradually increased until operation on the 13th. Temperature ranged from 98 4/5 F. to 100 3/5 F. No pain at any time and patient felt well. Dr. Budd's report shows blood culture negative; polynuclears 60 per cent; lymphocytes 37½; eosinophiles 1 per cent, and basophile 2 per cent.

X-ray Report No. 3—September 11, 1922, shows: 'Left mastoid pneumatic in type. Mastoid has normal appearance.

"Right mastoid shows sclerosis in anterior portion. This sclerosis is greater than observed at previous examination (see reports of previous examination). As reported previously, there is little or no cell formation throughout the whole bone; the cells which are present having a thickened and clouded appearance. There is a certain amount of rarefaction at the tip.

CONCLUSIONS: "The findings indicate that the old disease in the mastoid has undergone certain sclerotic changes, but this sclerosis is not completed and it is thought from the appearance of the plate that active changes are present."

OPERATIVE FINDINGS: Abscess cavity (subperiosteal) over and behind mastoid tip, containing several drams of pus from which culture showed staphylococcus aureus. A large

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fistula extending through the digastric groove into mastoid tip which was completely hulled out by necrosis of cellular structure. In the upper portion of the mastoid, the cells had been replaced by sclerosed bone by which the pus in the tip was walled off from a practically normal antrum. The lateral sinus plate was necrosed from just above the bulb upward toward the knee for one-half to three-fourths of an inch. Sinus was apparently healthy. Patient had an uneventful recovery and the wound was healed in about three weeks.

SUMMARY AND CONCLUSIONS.

1. The patient probably had a mastoiditis a year and a half ago, though with considerable doubt as to whether or not there was involvement of the middle ear.

2. During present illness a mastoiditis due to staphylococcus aureus with much pus and considerable cell destruction in the tip and with practically no pain and without involvement of the tympanum.

3. Bony sclerosis between antrum and the infected area.

4. Blood culture negative.

The question naturally arises whether we are dealing with an idopathic, or primary, mastoiditis; or a latent condition that has existed for a year and a half without giving signs or symptoms.

I think that we are dealing with a very low grade, quiescent, rather than a primary, infection, in view of the fact that we have a negative blood culture and no evident source of infection necessary for a metastatic process. And, furthermore, the absence in the mastoid antrum and tympanum might be explained by the fact that the sclerosis, produced by the inflammation a year and a half ago, prevented the extension of the infection upward into the antrum.

316 *East Franklin Street.*

ELECTROCARDIOGRAPHY IN THE DIAGNOSIS OF CARDIAC CONDITIONS.*

By F. C. RINKER, A. B., M. D., Norfolk, Va.

The use of the electrocardiogram is constantly increasing and its value as an aid to diagnosis and prognosis of cardiovascular conditions is becoming more indispensable. Much of the recent knowledge of the disorders of the heart's mechanism has been the result of graphic means of precision of which the electrocardiogram is the most valuable.

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The diagnosis of arhythmias, the localization of conductive lesions and the conclusions reached relative to the various tachycardias have been greatly aided by the interpretation of electrocardiographic records. No one recording instrument, however, should or ever will supplant the practical methods of physical diagnosis, but their value as adjuncts to clinical methods cannot be too strongly emphasized.

Electrocardiography is dependent upon the physiologic law, that when any muscle is stimulated the portion to which the stimulus is applied goes into contraction and this area becomes electronegative to the resting portion of the muscle.

It has been demonstrated that electric currents are produced with each heart beat. It is also an accepted fact that the cardiac beat has its origin in the sino-auricular node of Keith-Flack and that the impulses are transmitted to the ventricles through the auriculo-ventricular bundle of His.

These electric reactions are recorded by the electrocardiogram on a moving bromide paper in a camera mechanism by means of a string galvanometer. Whenever an abnormal condition occurs in either the conduction or contraction systems there results an abnormality in the tracing photographed. Experimental work has shown that typical abnormalities in the electrocardiographic records occur in given pathological conditions existing in the cardiac musculature.

The phases of the cardiograms have been named for convenience P. R. T. waves. P. represents auricular contraction and the origin of conduction, R. represents conduction of the impulse through the auriculo-ventricular bundle, and T. represents contraction of the ventricles.

Let us now consider some of the more common abnormal conditions occurring in the cardiac mechanism which may be interpreted by the electrocardiogram:

I. CARDIAC ARHYTHMIAS:

a. *Sinus Arhythmia* is a condition occurring in young persons, caused by vagus stimulation, resulting from respiratory action which affects the sino-auricular node and causes

slight slowing of the entire heart. The condition is non-pathological.

b. *Premature Contractions and Extrasystoles*: Premature contractions are very common in adult life. They may occur in perfectly normal hearts as a result of nervous irritability. The tracing shows an early occurrence of a cardiac cycle at varying intervals, the resulting cycle, however, is normal. When such a condition is found in adults or in persons with chronic heart disease, one should suspect myocardial changes.

Extrasystoles result from stimuli arising at some point remote from the sino-auricular node. The point of origin may be either in the auricular musculature, in the ventricular musculature, or at some point in the net-work of Purkinge. The tracing shows aberrant conditions existing in any of the three phases of the electrocardiogram. When found, extrasystoles indicate myocardial changes.

c. *Auricular Fibrillation* is the most important and the most frequent disorder of heart rhythm. It was described by MacKenzie in 1890 as an entity. It is due to some myocardial change resulting from (1) Foci of infection, (2) Retention of toxic products, resulting from faulty metabolism associated at times with imperfect renal function and (3) Increased cardiac work due to valvular lesions, hypertension, or to some alteration in cardio-vascular balance.

Auricular fibrillation may be suspected when there is a rapid irregularity of the heart's action associated with failure of all of the heart beats to reach the radial pulse. A positive diagnosis of the condition, however, can only be arrived at by the use of the electrocardiogram.

Mechanism: The stimuli arising in the sino-auricular node are extremely rapid, from 300 to 1,000 per minute. The auricles do not contract but go into a state of twitching and act only as reservoirs. Owing to the rapid and inadequate formation of the stimuli, only a few of the impulses get through the auriculo-ventricular bundle and an irregular, disordered, ventricular action results. Thus we find in this condition electrocardiographic tracings showing a marked increase in the auricular rate over the ventricular rate. The findings are characteristic: there is a gross irregularity, the cycle lengths are not uniform and for each R. wave there are a varying number of P. fibrillations, but the P. wave is absent.

The electrocardiogram is not only of value in the diagnosis of auricular fibrillation but it is an aid to the therapy of such a condition. Digitalis and the digitalis series or Quinidine are the drugs commonly used in the treatment of the disease. During the course of treatment one can more intelligently carry out such treatment if tracings are made from time to time. Here particularly the electrocardiogram is of much more value than any other means of precision.

II. Ectopic Rhythms and Tachycardias:

Whenever the impulse arises at a point remote from the sino-auricular node, the resulting heart beat is referred to as being ectopic. Such a condition is shown on the electrocardiographic tracing and it also shows whether the impulse orignates in the auricular musculature or in the ventricles.

a. *Bundle Branch Block* is a condition resulting from some interference with conduction along either the right or the left branches of the His bundle. The electrocardiogram records a picture typical of the condition and shows which branch is affected. This interference with normal cardiac mechanism is the result of focal myocardial changes and is not compatible with long life.

b. *Tachycardias*. The various types of tachycardias are ectopic except sinus tachycardia.

1. *Auricular Tachycardia*: In this condition the focus of stimulation has its origin in the auricular musculature. Each auricular contraction is followed by a ventricular beat and the rate does not exceed 200 per minute. The condition frequently occurs paroxysmally, lasting for only a short time. The P. wave is abnormal, usually inverted, indicating that the impulse arises outside of the sino-auricular node.

2. *Auricular Flutter*: May be described as an increase in the number of P. waves on the electrocadiogram to 200 or more per minute. The condition is usually accompanied by Block resulting in auriculo-ventricular dissociation of varying degrees. The Block is due to the inability on the part of the His bundle to transmit the impulses so rapidly, or to inability on the part of the ventricle to respond so rapidly.

Pathological difference between auricular tachycardia and auricular flutter is not known, but clinical and electrocardiographic findings justify a separation and classify flutter as a clinical entity.

III. Disorders of Conduction:

Transmission of impulses along the normal conduction paths of the autonomic nervous system of the heart may be interrupted by disease. The electrocardiogram not only aids in the diagnosis of such disorders but localizes the point in the conducting system which is causing interference.

(a) *Heart Block or Complete Auriculo-Ventricular Dissociation*: This condition is due to failure of the His bundle to conduct the impulses originating in the sino-auricular node. The ventricles, however, assume an independent impulse and contract slowly and late.

One may suspect heart block when there is a ventricular rate of less than 40 per minute, but a definite conclusion can be arrived at only by the use of the electrocardiogram. Tracings show a prolongation of the P-R interval and there will occur more than one P to each R wave.

(b) Conditions of poor conduction through the auriculo-ventricular bundle or along either of the bundle branches are shown on the electrocardiogram by splintering, or other aberrant conditions occurring in the R wave. When such abnormalities are found, myocarditis of varying degree should be suspected.

IV. Ventricular Preponderance:

The reliability of electrocardiography as a method of determining ventricular hypertrophy has been severely cristicised. Its value at present, however, is accepted by most authorities. To the clinician the knowledge of ventricular preponderance in cases of valvular heart disease is of great value, not only in the treatment and management of the case but in the prognosis.

The tracings show: (1) Negative R waves in lead, 3 with positive R waves in lead, 1 in cases of left ventricular hypertrophy, and (2) in cases of hypertrophy of the right ventricle there are negative R waves in lead 1 and positive R waves in lead 3.

Abnormalities or varying types are found in the T waves in cases of myocarditis and coronary sclerosis.

However great my desire may be to go into more detail in the description of the various cardiac conditions and their relation to electrocardiographic findings, time requires me to stop here.

In conclusion, I wish to say that I believe the electrocardiogram is going to be increasingly used by clinicians and its value as a means toward better therapy and more definite prognosis will be accepted more completely within the near future.

Sarah Leigh Clinic.

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PAPILLARY CYSTADENOMA OF THE OVARY.

Pathology and Prognosis.

By JAS. W. GIBBON, M. D., Charlotte, N. C.

Papillary cystadenoma of the ovaries is a disease distinguished by the obscurity of its etiology, its extraordinary pathologic manifestations, the variabily of its course, and uncertainty of prognosis. While the rarest cystic disease of the ovaries, it occurs often enough to deserve study by the surgeon as well as the pathologist. The surgeon should regard it with more than temporary interest, since the treatment and prognosis each are influenced by the pathology of the individual tumor.

The frequency, as compiled by many observers, has roughly approximated. Thus, of all cystic diseases of the ovaries, Erdmann and Spaulding found papillomata in 18 per cent. of the cases, Pfannenstiel in 15 per cent., Coblentz in 10 to 15 per cent., McCarty, at the Mayo Clinic, found 163 papillomas among 1,000 cases of cystic ovaries. Kelly gives 22 per cent., and Libbert 27.5 per cent. The frequency therefore varies from 10 to 27.5 per cent.

The relation which papillary cystadenoma holds to other ovarian pathology is best illustrated by the classification of Hertzler.

A. Retention Cysts.
1. Luteal Cysts
2. Follicular Cysts
   a. Graafian Follicle Cysts
   b. Multiple Fibrocystic Degeneration
   c. Tubo-ovarian Cysts.

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The characteristic of this group is that they are not neoplastic, and are formed by some minor disturbance in the normal physiologic processes in the ovary.

B. Proliferating Cysts.

1. *Simple Proliferating Cysts of the Ovary.* In this type, the epithelium of the cyst takes an active part in the growth of the tumor, but its chief activity is manifest in an increased secretion, cell proliferation being confined to a degree necessary to line the cyst wall as it increases to accommodate the collecting fluid.

2. *Adenomatous Cysts of the Ovary.* Here the epithelial proliferation is in excess of that required to line the cyst walls, and is regarded as a true neoplasm. Of these cysts, there are two distinct varieties, depending on the character of the fluid of the cyst.

a. Pseudo-mucinous cysts are those in which the cells secrete a thick gelatinous, so-called pseudomucin. These cysts may again be divided into the *Everting or Glandular Type*, in which the proliferating cells form new cysts in the walls of the mother cyst, and a large multilocular cyst is the result. Or the proliferating cells may form papilla projecting into the cyst cavity, the *Inverting or Papillary Type*. While the proliferating cells in the pseudomucinous cysts may take either of these forms, these cysts are commonly of the everting or glandular type, forming large cystic tumors with great numbers of varying size smaller cysts in the walls. Papillary projections may occur into some of the cyst cavities, but it is unusual. A final and very significant feature of the pseudomucinous cyst is the remote probability of malignant degeneration, and this stands in sharp contrast to those cysts which abundantly develop intracystic papillary growths, and are so likely to malignant change.

b. The other variety of Adenomatous Cyst of the ovary is the *Serous-Cystadenoma*, because the fluid secreted is thin and serous. This tumor may also be of the everting or glandular type, or inverting or papillary type, just as in the pseudomucinous, but with far greater frequency it is characterized by extensive intra-cystic or papillary growths. Papillary serous cystadenomas occur later in life than the pseudomucinous cysts, and are very prone to malignant changes. It is the individual pathology of this cyst, the papillary cystadenoma, that is herein considered.

Age.—The most common age of occurrence is between 40 and 50 years. The next most frequent decade is 20 to 30. Childbirth has not been considered to have any bearing on the causation.

Fig. 1 Shows both papillomatous ovaries from the same patient. The large cauliflower-like papillomata can be seen growing on the external surface of the unruptured larger cyst. The smaller cyst has been opened to show the same growth on the interior.

Origin.—The origin of these tumors has long been a subject of confusion and difference, and even today there is no unity of opinion regarding this. Discussions have centered about the germinal epithelium, the Graafian follicle, Wolffian body, and Pflueger tube as possible points of origin. The most recent theory of histogenesis is presented by Goodall after a long and comparative study of many microscopical sections. His conclusion is that the origin of all epithelial structures within the ovary is from the germinal epithelium, and he does not believe that it is ever possible for tumors to develop from the Graafian follicle. This view has been accepted by most authorities.

Pathology.—Ovarian papillary cystadenoma is a bilateral disease, developing simultaneously in both ovaries. There is, however, usually very great disparity in size between the two cysts, and the stage of the disease is commonly more advanced in the one than the other. The cysts may be multilocular, but as a rule there are not as many daughter cysts as in the pseudomucinous variety. They are chiefly characterized in the late stages by the abundance and prominence of the papilloma-

tous growths. If there are several cyst cavities, each usually contains its share of papillomata. These cysts do not attain a large size, at least so large as the pseudomucinous, and the case reported by Bland-Sutton where the tumor weighed seventy lbs. is the exception and not the rule. In the early stage, the capsule is firm, smooth, and thin, and projecting from the inside of the cyst-walls are the papillomatous growths. These vary greatly in number and size, depending more or less on the stage of the disease. They may appear in the early tumors as small, warty, pea-sized or shot-like elevations along the interior wall of the cyst. At the other extreme, the papillomata may form enormous, irregular, cauliflower growths filling almost the entire cyst cavity, and be so closely packed together as to present the appearance of a solid tumor. The papillomatous growths are soft, semigelatinous, bleed easily, glistening, slimy and sticky. The color depends on the blood supply. In well supplied areas it is pinkish, though it may be a dirty gray or yellow. There may be more or less calcific deposit, varying from small gritty deposits to larger plates.

The fluid in the cyst is characterized by the absence of pseudomucin, and the presence of a large amount of albumen. It is not tenacious, rather serous, and is usually yellow or straw-colored, or dirty green. Degenerations of one kind or another and hemorrhage alter the appearance of the fluid.

The papillomata in the first stages are limited to the interior of the cyst cavity, the capsule is smooth, there are no peritoneal implantations and no ascites. As the tumor grows, cell proliferation infiltrates the cyst wall, the capsule becomes roughened, nodular and friable, and finally is ruptured or perforated, and the cauliflower masses of papillomata continue to grow in great abundance on the external surface of the cyst, and project free into the general peritoneal cavity. Perforation of the capsule in papillary cystadenomata of the ovary usually comes at an advanced stage, and mutiplies many times the gravity of the disease. It is not uncommon to find a large cyst on one side in these late stages of growth, while the opposite one is very small, and contains only a few warty excrescences lining the inner wall of the cyst. In other words, while the occurrence of this disease is simultaneous in both ovaries, the stage of development of the two cysts is usually markedly different. It has been suggested that the involvement of the second ovary is the result of so-called "cell droppings" or contact metastasis from the opposite, primarily involved one.

With the perforation of the capsule and external growth of the papillomata, infection of the peritoneoum by contact metastasis is the outcome. Warty, nodular transplants then develop and spread over the entire peritoneal surface, the dispersal of the cells being facilitated by the continual movements of the intestines. Prompt association with this infection of the peritoneum is the productic of an enormous amount of free fluid in the peritoneal cavity. The great bulk of this accumulating fluid is one of the extraordinary features of the disease, and it is principally for enlargement of the abdomen that these patients seek relief. The size and distention of the abdomen quickly becomes collosal, as the

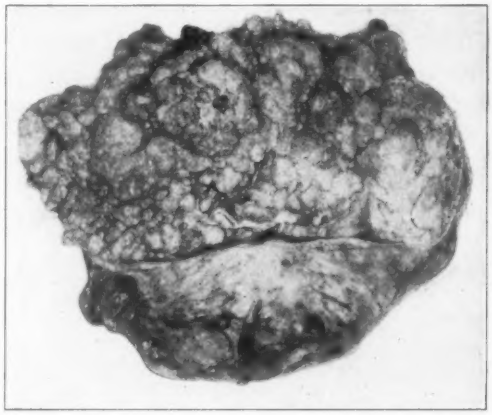

Fig. 2. Shows the interior papillomatous growths in a larger cyst which has been opened. The cyst wall is seen in the lower half of the picture.

fluid increases and even obscures the presence of the ovarian tumor. In elderly women suffering from tremendous ascites associated with a pelvic mass, the possibility of a papillary cystadenoma of the ovary with peritoneal implantations is very likely. The ascites, however, does not invariably mean peritoneal metastases have occurred. In one of our own cases. on opening the abdomen, an enormous amount of green fluid was evacuated, the right

ovary presented a large papillary cystadenoma which had perforated the capsule and developed masses of papillomata on the external surface, and the left ovary, also cystic, was smaller and showed nodular excrescences only over the inside of the wall. The peritoneum in the lower half of the abdomen was hyperaemic, angry looking, and thickened, but without any evidence of secondary, metastatic nodules.

The question of the origin of this great bulk of ascitic fluid has been raised. Klein, in studying the microscopical appearance of the papillomata or warts, has remarked upon the structural resemblance to the chorionic villi. and came to the conclusion that the "epithelium in some papillomatous cysts possesses a secretory function analogous to that of the chorionic villi," and that the ascites was the result of the secretory activity of the epithelium covering the papillae. It does not, however, seem improbable that some of the fluid in the abdomen might not be due to an irritant reaction in the peritoneum in which case the peritoneum itself secretes fluid, and is similar to the hydroperitoneum observed in the carcinomatosis peritonei, or tuberculosis of the peritoneum.

Structure.—Papillary cystadenomata are composed of a rich and abundant stroma supporting the epithelial elements. The stroma constitutes the wall of the cyst, and the stalk of the papilloma. The epithelial cells are cuboidal or low columnar and line the inner wall of the cyst, and cover the stalks of the papillomata in one continuous single layer. They lie upon a uniform basement membrane, and show no evidence of infiltration. Carcinomatous change is the most likely and is manifested by a multiplication of the lining cells instead of one layer there are many, the cells become large and atypical and mitotic figures will be seen. The basement membrane is broken through and the stroma infiltrated. The orderly arrangement ceases and the cyst becomes the papillary adenocarcinoma.

Course.—The course of papillary cystadnomata is slow and relatively benign, still there is always the question of malignancy. The clinical behavior of these cysts varies to such striking degrees. Though recognized as benign, often it is a lesion very readily converted to a malignant one, a change which is not necessarily perceptible in the gross appearance. The true papillary cyst-adenocarcinoma may differ not at all from the benign papillary cystadenoma in the clinical course and gross pathology. So that when confronted with the condition, there is no little uncertainty about how benign or how malignant the tumor may be. Ewing believes that "the majority of these adenomas long retain their benign type, and that there is some ground for the view that the malignant tumors are carcinomatous from the first." On the other hand, Pfannenstiel considers that 50 per cent. of the papillary cystadenomata reveal an adenocarcinomatous structure in at least some portions of the tumor. Erdmann considers these tumors all potentially malignant.

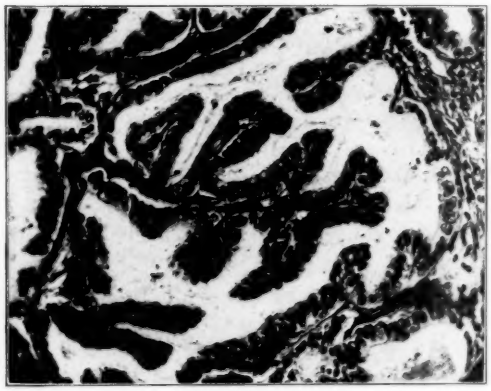

Fig. 3. Shows a high power photomicrograph of a papillomatous cyst. The cyst walls and the papillary projections are seen to be largely lined by a single layer of epithelial cells. This represents the structure of the tumor in which the prognosis for cure is best after the surgical removal. As a tumor, it is of slow growth and relatively benign.

Yet, proof of the benignity of many papillary cystadenomata, even when peritoneal implantations have occurred, is seen in cases which have had a laparotomy years after a previous oophorectomy for this disease, by the observation that all the peritoneal implantations had disappeared. Corcia reports the case of a woman, aged 32, with bilateral papillary disease of the ovaries, widespread peritoneal implantations, and general ascites, who was perfectly well seven years after a double oophorectomy. Other similar reports are to be found. Nevertheless, there are also cases reported in the literature which were unquestionably malignant, cases in which there were general metastases. Wagner's case of a woman, aged 48, had been tapped over a period of ten years on account of an ovarian tumor, and was found

at autopsy to have papillary metastases in the chest well, left flank, and right axilla. Wilkes and Moxon give an autopsy record of a woman, aged 60, with papillary metastases in the lungs and liver. Bland-Sutton reports the case of a woman of 56 years from whom he removed bilateral papillary cysts and the uterus. Six years later he removed a secondary papillomatous growth from the sternum. She died as a result of a recurrent growth in the superior mediastinum and upper right half of the thorax. Erdmann reports two cases in which the tumor recurred in the abdominal wound after the removal of the ovarian growths, one fourteen months, and the other twelve years after the primary operation. Even when the tumor is recognized as clearly malignant, the course may be unusually slow and recurrences late, as illustrated by another case reported by Erdmann. A woman aged 54, had papillary disease of both ovaries. The ovarian masses were removed, but considerable peritoneal deposits remained. The pathologist prounounced it Ovarian Papillary Adeno-Carcinoma. Twelve years later she returned for re-operation with an extensive malignant peritonitis and metastases in the abdominal scar.

In papillary cystadenoma of the ovaries, lymphatic invasion is very infrequent, and distant metastases, while reported in certain cases, are not the rule and, when they do occur, do so only after long intervals. The involvement of the peritoneum is late in the course of the disease and not a true metastasis, but a direct implantation. Cases in which there are metastases are the cases in which already malignant change may have taken place in some part of the tumor, and it is the view of the writer that metastases never occur in the true cystadenoma. It is very likely this fact which accounts for the marked difference in the ultimate results following the operative treatment of these tumors.

Prognosis.—The widest extremes have been observed in the prognosis following the surgical treatment of papillary disease of the ovaries. Bland-Sutton remarks that when the papillomatous cysts are removed, "the fluid ceases to accumulate and the peritoneal warts disappear. as a rule." A great number of women from whom papillary cysts are removed make durable recoveries, but it is still difficult to assert that the recovery is permament. Some years ago papillomatous tumors of the ovaries were all considered malignant, forming a special class, and many times it happened that cases which presented a very extensive process after opening the abdomen have

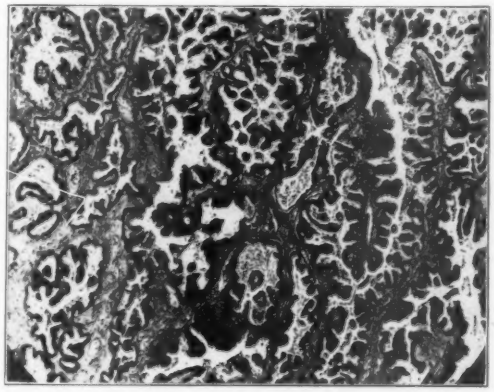

Fig. 4. Shows a low power photomicrograph of a papillomatous cyst.

been considered "inoperable" and the abdomen closed, and an early death of the patient from cachexia resulted. Pfannenstiel was one of the first to demonstrate that these papillomata may not be originally malignant, and may be cured by removal of the cystic ovaries. Hyde believes a certain number are cured, but owing to the scantiness of the medical literature, it is difficult to determine how many. It is generally estimated that about 50 per cent. undergo malignant change when, of course, the possibility of cure is not as good. Codman in discussiing "Malignant Peritonitis of Ovarian Origin" based on the study of twelve cases deducts the conclusion that "the prognosis is more favorable than is usually believed." Even incomplete removals are known to have been followed by cures. I believe the general trend is to view even extensive cases more hopefully, and to at least give the patient the best chance by removing the original tumors.

The results following the treatment of these lesions can best be understood by classifying them into several groups. In the first definite group the metastases entirely disappear after extirpation of the primary tumors. This favorable outcome occurs almost exclusively with structures which are non-malignant, and in which the lining cells of the papillae are not atypical and appear in orderly, single rows.

This spontaneous retrogression has been observed by many writers.

In another group, the implanted nodules continue and spread over much of the peritoneal surface, causing adhesions between the intestines, the accumulation of large amounts of ascitic fluid, and finally, death from cachexia, or intercurrent disease. These are the patients which may live for long periods of time after the removal of the ovarian tumors, but who require repeated tappings to drain off the excess of the accumulating fluid, until death finally brings an end.

In a third group the tumor recurs locally after extirpation in the form of papillary nodules at the stump, in the wound, or in the peritoneum. In this group, an unusually long period of observation is necessary, as recurrences have been observed at the site of the tumor or in the peritoneum after 13, 15, 20 and 21 years, and in the line of incision after 21 years. (Malcolm, Opitz, Pozzi, Holzapfel. and Olshausen quoted by Ewing). Even after recurrences the patient may survive many years in fair health.

Finally, the implantations may rapidly or gradually change their type and become malignant, spreading through the abdomen and causing distant metastases and death.

The prognosis then depends very largely on the degree of malignancy of the individual tumor, and is probably best attained after a thorough investigation of the histological structure. In the first group, where there is a single layer of comparatively normal epithelial cells lining the cyst spaces and covering the papillae, cure should follow the extirpation of the original tumors, in spite of the fact that there may be widespread peritoneal implantations at the time of the operation. In the second and third groups, the prognosis for life is still fair. In either of these groups the patient may live a number of years in comparative comfort after excision of the primary tumors. In the fourth group the prospects are never good, but even then the progress of the disease may be slow, and years may be added to the life of the patient by removal of the ovarian growths.

With these facts in mind, it would seem justifiable in all cases to remove the primary tumors regardless of how extensive the peritoneal involvement, or what the pathologist reports.

A formulation of the ultimate results based on a more careful microscopic control would likely add much to our present knowledge of this unusual disease.

1206 *Realty Building.*

TIME AND MORTALITY.*

By J. E. RAWLS, A. B., M. D., F. A. C. S., Suffolk, Va.
Senior Surgeon to Lakeview Hospital

Some months ago it was my pleasure to read before a neighboring medical society a paper entitled "When to Operate for the Questionable Acute Appendix." In this paper we attempted to show how the element of *Time* played in the *Mortality* of these acute appendiceal conditions.

Today, in this paper we wish to re-emphasize this truth by reporting further histories or cases. With this aim in view, we have selected the acute appendiceal cases operated on in Lakeview Hospital from October 1st, 1919, to Ocotber 1st, 1921. During this period there were 177 operations for acute appendicitis (excluding the chronic cases). The mortality in these 177 cases, covering all degrees of infected pathology from acute non-perforated appendix to a general diffuse peritonitis, was a fraction over four and one-half per cent.—in numbers eight died out of 177 cases and 169 recovered. All cases were treated surgically.

For surgical treatment, acute appendicitis, can be divided into two classes—*non-perforated and perforated.* Of these 177 cases there were 114 non-perforated and sixty-three perforated, covering all degrees of infective pathology from an acute perforated to a general diffuse peritionitis. In the 114 non-perforated cases there was no mortality, no deaths. In the sixty-three perforated cases there was a mortality. there were eight deaths.

We will briefly review the histories of these eight fatal cases to see if we cannot gain some helpful information, especially emphasizing *first*, the time elapsed between the onset of the symptoms and the admission of the patient to the hospital; *second*, the time elapsed between admission to the hospital and time of operation; *third*, the pathology found at time of operation.

I. Case number 1390, male, age 25. First

*Prepared for but not read before the fifty-second annual meeting of the Medical Society of Virginia in Lynchburg, October 18-21, 1921.

attack. Was admitted to hospital at 4:00 P. M. November 9, 1919. *For seven days previous to admission to the hospital, patient had been suffering with a general abdominal pain and tenderness*, but his pain did not definitely localize until the afternoon before the patient was admitted to the hospital. The patient was operated on at 6:15 P. M., two hours and fifteen minutes after admission. The pathology found was an appendiceal perforation with a general peritonitis. He died.

II. Case number 1434, male. age 68. First attack. Was admitted to the hospital at 9:00 P. M. November 23, 1919. *For four days before admission to the hospital had been having general abdominal pain which began in epigastrium but did not localize until the night before admission to the institution.* The patient was operated on at 9:50 P. M., fifty minutes after admission. The pathology found was a perforated appendix with free pus in the general peritoneal cavity, causing a general peritonitis. He died.

III. Case number 1839, female, age 28. First attack. Was admitted to the hospital at 5:25 P. M. on May 4, 1920. *One week before admission to the hospital developed a general abdominal pain followed by nausea and vomiting, and pain localized in region of appendix twenty-four hours after onset of the disease, and six days before admission to the hospital.* Was operated on at 8:30 P. M., 3 hours and 20 minutes after admission. The pathology found was an appendiceal perforation with a general diffuse peritonitis. She died.

IV. Case number 1936, female, age 7. First attack. Was admitted to the hospital at 7:00 A. M. June 6, 1921. *Three days before admission to the hospital patient began to have abdominal pain which was relieved some by vomiting, but continued to have more or less pain, but pain never localized and general condition grew worse until patient was admitted to the hospital.* The patient was operated on at 8:25 A. M., 1 hour and 25 minutes after admission. Pathology found was a perforation of the appendix with the distal one-third of the appendix gangrenous and with free pus in the peritoneal cavity. She died.

V. Case number 1955. male, age 30. Second attack, which followed "Flu" eighteen months ago and localized. For last attack, admitted to hospital at 3:10 P. M. on June 21, 1920. *Two days before admission to the hospital at 2:00 P. M. had epigastric aching with vomiting, which pain localized in region of appendix within twelve to eighteen hours after onset.* Patient was operated on at 4:25 P. M., 1 hour and 15 minutes after admission to the hospital. Pathology found was a perforated gangrenous appendix with free pus in general peritoneal cavity. He died.

VI. Case number 2314, male. age 47. First attack. Was admitted to the hospital. 6:30 P. M. October 22, 1920. *Four days before admission to the hospital began to have general abdominal pain followed by nausea and vomiting but pain did not localize but was more tender in neighborhood of umbilicus and at times in the right lower quadrant of the abdomen.* Abdomen became markedly distended and hiccoughs began two days before admission to the hospital. Was operated on 1 hour and 25 minutes after admission. The pathology found was a perforated gangrenous appendix, five inches long, extending into the pelvis with pus free in the general peritoneal cavity. He died.

VII. Case number 2605, female, age 13. First attack. Was admitted to the hospital at 9:20 P. M. March 12, 1921. *Six days before admission had an attack of nausea. Two days later general abdominal pain began. More marked in the appendiceal region.* Some vomiting. On the day of admission pain more severe with frequent vomiting. Was operated on in 1 hour and 20 minutes after admission. The pathology found was a perforated appendix with pus free in general peritoneal cavity. She died.

VIII. Case number 2461, male, age 65. First attack. Gave a history of several attacks of renal colic. the last, six years ago. Was admitted to the hospital at 11:40 P. M., March 29, 1921. *Nine days before admission to the hospital was taken quite suddenly with violent pain just below umbilicus. Next day some general abdominal pain and soreness but less severe. However, more marked in lower right quardant of abdomen.* This soreness kept up each day and has had some vomiting. Was operated on 2 hours and 35 minutes after admission to the hospital Pathology found was

acute perforated appendix with pus free in the general peritoneal cavity. And he died.

COMMENT.

Now, here are eight deaths that could have been definitely prevented. Naturally, the question arises who is the guilty party? Upon whom shall the blame be placed? This question cannot be answered in this paper from the histories given, but it is hoped in the near future the blame can be placed upon the guilty party or parties, that these poor victims may be saved.

The parties subject to accusation can be divided into two distinct classes of individuals, and these two classes are divided by the door of the hospital. *First*, those that have charge of the patient before admission to the hospital; *second*, those that have charge of the patient after admission to the hospital. It is a known and accepted fact that all hospitals, of whatever standard, are attended with more or less mortality in operative cases. This is the experience with all classes of hospitals. It makes no difference whether the institution is a tyro or novice or whether it is a hospital of the most perfect standardization. A varying degree of mortality rate accompanies all classes of hospitals. All of the operative cases cannot be saved by simply sending them to some definite institution of high repute. So we have to look elsewhere to be able to save all of those patients whose histories were read.

This leaves us to consider those that have charge of the patients before admission to the hospital. These are divided into four classes of individuals.—

1st. The patient's neighbors and friends.
2nd. The patient's immediate family.
3rd. The patient himself.
4th. The patient's family physician.

The period or duration of the disease before the patient is admitted to the hospital generally determines the course of the disease after admission to the hospital. This is the prophylactic, or better, incipient period. Yes, this period holds in its grasp the patient's destiny as to life or death. This was emphasized in reviewing the 177 cases reported, when it was found that there were no operative deaths in the 114 non-perforated cases, and further that *no perforations took place under twenty-five hours from the onset of the disease, save one*, which was twelve hours, *and it was the fourth attack.* In other words, based on these 177 cases, there would have been no deaths had they been admitted to the hospital and operated on within twenty-five hours from the first symptoms of the disease. *This is a fact that we should not forget.* The shortest period, with the fatal cases reported, from onset of the disease until admitted to the hospital, was over two days, about fifty hours, and the longest period was nine days, and in one case in which the pain had been localized for six days before admission. Is it not reasonable to suppose that these eight cases would have been saved had they been admitted to the hospital and operated on within the first twenty-five hours of onset of symptoms?

If getting them in the hospital early will save them, how can this be done? If the delay is due to the patient's neighbors, or to his family, or to himself, then these obstructions should be removed. How may they be removed? *Only by public education.* We, as a profession and nation, are and have been trying to educate the public on questions of typhoid fever, venereal diseases, cancer and tuberculosis. We have recently received literature stating that the Virginia State branch of the American Society for the Control of Cancer is in process of organization. The Chairman of the committee for Virginia is our esteemed Dr. Robt. C. Bryan, of Richmond, Va. An intensive campaign will be launched throughout the United States from October 30 to November 5, 1921, and I dare say, the slogan will be prophylaxis or early diagnosis and definite action. This is a humanitarian and commendable work. May the efforts of this organization be felt throughout our country by alleviating suffering and saving humanity. But, are we not neglecting an important branch of diseases, when we keep silent on acute abdominal conditions, especially acute appendicitis? We must not forget that over 12,000 die annually of this disease in the United States.

Would it be out of place to say that the public should be taught three facts:

1st. The location of the vermiform appendix;

2nd. That the four usual symptoms of appendicitis, are general abdominal pain, nausea or vomiting, localized pain anl tenderness,

and fever, and that the symptoms take place in the foregoing order. (Murphy);

3rd. *And lastly, that practically all get well if operated on within the first twenty-five or thirty hours after onset of disease.* This would greatly help the family physician to overcome two of the three obstacles that usually confront him when the acute abdominal conditions befall his patients.

The first obstacle is that the neighbor, family, and patient himself believe he has the "bellyache" or acute indigestion and thus he doctors himself and delays sending for the family physician. Thus, the family physician is unable to get patient to the hospital in time.

The second obstacle the family physician has to overcome is to persuade the neighbors, family, and patient the necessity of early operation. *Proper public education would overcome both of these.*

The third obstacle that confronts the family physician and causes delay is the "questionable appendicitis," that is, questionable so far as symptoms are concerned. This is the story of some neglected cases from the lips of the most conscientious and efficient family physicians. They say that the abdominal symptoms began several days ago but symptoms were "questionable" and pointed to no definite pathological entity. This is true as quite a number of appendiceal attacks come on indefinitely as to symptoms, and thus it is difficult or impossible to make a definite diagnosis. I received a letter a few days ago from a good, level-headed, conscientious physician who stated that he never allowed himself to give the second dose of morphine in any acute abdominal condition without considering surgical treatment.

John B. Murphy once stated dogmatically that the time to operate on acute appendicitis was as soon as a diagnosis was made. At first most of the profession thought this radical, but time has brought most of us to this idea. Now, to go a step farther, *and say the time to operate for appendicitis is before the diagnosis is made would seem quite radical. This is what we claim in these questionable abdominal appendiceal conditions, and the operation should take place as early and as promptly as in the most typical acute clinical history. To operate and find no definite pathology would be a mistake coupled with no mortality.* To delay, waiting for more definite symptoms to develop, carries a great number of unfortunate victims to death, as was the story with some of the fatal cases reported. *If a mistake is to be made, by all that is good and holy, make the former. Remember that it is a question of time, the period from the onset of the disease to time of operation that will annihilate the mortality, and that only.*

Delay and the ice bag play the same role in acute appendicitis, as delay and cod liver oil play in the incipiency of pulmonary tuberculosis, or delay and the local application of some favorite salve play in the cure of cancer in its early stages. These measures inspire false hope which will carry a great number to destruction and feed your mortality rate. Mortality will never be reduced to a nonentity by discussing and considering pathology and technique at operation. Mortality must be reduced and lives must be saved by early and thorough definite action.

Save life! This is the physician's true mission. This is why so much time has been spent in talking about the eight unfortunate ones that were lost, and casually of the 169 that were saved. The saved ones should not concern us so much. Remember, the Great Nazarene came to save that which was lost, and was concerned, not in the ninety and nine, that were safely led, but the one that went astray. May we as true physicians, apply this principle, physically, in our life's work.

Correspondence.

Bonds for Good Roads.

THE PLAINS, VA.
FEB. 26TH, 1923.

TO THE EDITOR:

In my article published in one of your recent issues, advocating an increased tax on automobiles, I seem to have given some of my friends the impression that I was opposed to the Bond Issue. On the contrary, I believe that the Bond Issue is the most *economical*, *quickest* and *best possible plan* for the financing and building of our roads. And I only suggested the increased tax on automobiles as a substitute, in case the Bond Issue should again fail to pass the Legislature; also to emphasize as strongly as possible how much slower and more burdensome any "Direct Tax"

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plan for building roads must necessarily be, as compared to the Bond Issue plan.

Indeed, either the double tax on automobiles, or the proposed 3 cent tax on gasoline, would produce comparatively so little money to work with, that we would probably be compelled to put on both in order to institute a "Pay-as-you-go" plan that would really go anywhere, that is to say, would give us an appreciable mileage of good roads in a reasonable length of time. Whereas the advocates of the $12,000,000 Bond Issue estimate that a 1 cent gas tax will alone take care of this amount of bonds, both interest and sinking fund.

North Carolina has already issued in

Road Bonds	$ 65,000,000
West Virginia	50,000,000
Maryland	40,000,000
New Jersey	40,000,000
Pennsylvania	50,000,000
and New York State	100,000,000

If there is in the State of Virginia such an anomaly as a country doctor who is opposed to the Bond Issue, I would advise him to take a trip into some of these States, as I have done, drive over their good roads and ask the people there what they think of the Bond Issue, then come home, settle down in the mud again, and ask yourself what you think. And, if you still think that you prefer the mud, you had better call in two other physicians and a magistrate at once and have your mental condition looked into.

I know of no State that has yet succeeded in building a Highway System, worth calling such, without a Bond Issue. In fact, I have on my desk now a letter from Mr. V. D. L. Robinson, Secretary of the Virginia Good Roads' Association, in which he says that Ohio is the only State that has attempted a large Road Program without the issuance of Bonds, and that there, with a plan by which the counties put up part of the cost, it has resulted in a *disconnected, patch-work* system of roads.

Last winter while the Legislature was wrangling over the Bond Issue and getting itself "dead-locked" and I was riding *horse-back* over roads that were already "dead-locked" to everything except the horse, I circulated no less than three petitions, got them signed by many of the leading citizens of this County and sent them in—all *in favor* of the *Bond Issue*. And *I am as much in favor of it now as then.*

I hope that I have cleared up any erroneous impression that I may have given in my recent letter, as to my attitude toward the Bond Issue.

RICHARD MASON, M. D.

Analyses, Selections, Etc.

Transmission of Syphilis to the Second Generation.

Authors summarize: It is highly probable that all mothers of syphilitic children are infected, although occasionally mothers of syphilitic infants have negative Wassermann reactions, and more of the mothers of older syphilitic children have weakly positive or negative reactions. In all such instances the maternal infection is latent. A strongly positive Wassermann reaction in the mother does not mean that her infant will necessarily be infected, and, consequently, a syphilitic mother may bear a healthy child. When the mother's Wassermann reaction is positive with the cholesterolized antigen only, the chances are about seven to one that the infant is not syphilitic.

In most instances the father brings the infection into a family, although nearly 40 per cent of the fathers of syphilitic children have negative Wassermann reactions (at the time the children are examined). He may, therefore, transmit the disease after his infection has become latent. Transmission to the third generation is possible, but is incapable of proof.

Identical or single ovum twins born to a syphilitic mother are both infected or both escape the disease, double ovum twins, on the other hand, have the same fate as children of two successive pregnancies, i. e., either, neither or both may be infected.

Adequate treatment of the syphilitic mother during pregnancy will result in a nonsyphilitic infant if the treatment is instituted before the fetus is infected. Often a relatively small amount of treatment is necessary to accomplish this. Subesquent pregnancies are not protected unless treatment is continued. It is probable that when a mother becomes infected during the pregnancy the fetus is infected also, but the treatment of the mother may be followed by a milder infection in the infant and lessen the danger of a fatal infection in utero.

Placentas of syphilitic infants show characteristic diffuse microscopic changes in 27 per cent of cases. When such changes are present the infant later proves syphilitic in every instance.

Syphilitic infants at birth have Wassermann reactions in the following proportion: 37 per cent negative, 18 per cent weakly positive and 45 per cent strongly positive. After the first few weeks or months all syphilitic infants have strongly positive Wassermann reactions. Syphilitic infants over 2 months of age fail to show clinical evidence of the disease at one examination in 50 per cent of instances.

Nonsyphilitic infants may give weakly positive Wassermann reactions at birth which become negative later, but never give strongly positive reactions at birth or any other time. All mothers of such nonsyphilitic infants as give weakly positive Wassermann reactions have themselves reactions of equal or greater intensity than their infants. In these instances the fixing substances are probably transmitted from the mother to the infant without transmitting infection.

Hutchinson's triad of interstitial keratitis, enamel defects of the upper central incisors, and nerve deafness are rare.

In older children with active manifestations of syphilis the Wassermann reaction is positive in almost 100 per cent. Certain possible exceptions are noted all of whom had keratitis. A diagnosis of active hereditary syphilis in a child with a negative Wassermann reaction is justifiable only when the clinical evidence of the disease is absolute and unmistakable. (J. V. Cooke and P. C. Jeans, *American Journal of Syphilis*, October 1922.)

Bismuth in the Treatment of Syphilis.

Bismuth was first tried experimentally in dogs with a view to using it for the treatment of syphilis in 1889 by Babzer. He was, however, discouraged by the occurrence in these animals of stomatitis and of a condition resembling dysentery. In 1916 Saxton and Robert, of the Pasteur Institute, showed that tartro-bismuthate of sodium and potassium prepared by Cowley's method cured spirillosis in fowls. Later Levaditi used bismuth in the treatment of tryanosomiasis, and has recently published his conclusions regarding its effect on syphilis in man (Presse Med., July 26, 1922). Using the tartro-bismuthate referred to above, he finds that it secures rapid cicatrization of syphilitic lesions at any stage of the disease The effect appears to be lasting and the Wassermann reaction is kept negative by the treatment. He believes that bismuth is certainly superior to mercury, and equals the best arsenical preparations. These manifestations of the disease which resist both mercury and arsenic yield to bismuth, and so far, no lesion has been found to resist its action. The metal is slowly absorbed and persists in the organism. Thus "the patient continues to treat himself long after the doctor has done with him." (Editorial, Medical Press, London, August 30, 1922.

The Truth About Medicine

During January, the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-official Remedies:

Lederle Antitoxin Laboratories:
Bacillus Acidophilus Milk-Lederle.

E. R. Squibb and Sons:
Bacillus Diphtheroid Allergen—Squibb.
Staphylococcus Citreus Allergen—Squibb.
Bacillus Influenzae Allergen—Squibb.
Egg Yolk Globulin Allergen—Squibb.
Horse Serum Allergen—Squibb.

Winthrop Chemical Company:
Theocin Sodium Acetate.

NEW AND NON-OFFICIAL REMEDIES.

Digitan Ampules (for Hypodermic Use).—Each Cc. contains 16 minims (1 Cc.) of a sterilized solution of digitan (see New and Non-official Remedies, 1922, p. 105), equivalent to digitan, 1 1-2 grains (0.1 Gm.) Merck and Co., New York.

Digitan Solution (for Oral Use): 1 Cc. contains digitan (see New and Non-official Remedies, 1922, p. 105), 1 1-2 grains (0.1 Gm.) Merck and Co., New York. Jour. A. M. A., Jan. 13, 1923, page 106.

Bacillus diphtheroid Allergen—Squibb.—Prepared from the protein from Bacillus diphtheriae.

Staphylococcus citreus Allergen—Squibb.—Prepared from the protein from Staphylococcus citreus.

Bacillus Influenzae Allergen—Squibb.—Prepared from the protein from Bacillus Influenzae. For a description of the Bacterial Allergens—Squibb. See New and Non-official Remedies, 1922, p. 247.

Egg Yolk Globulin Allergen—Squibb.—Prepared from the purified globulin of yolks of hens' eggs.

Horse Serum Allergen—Squibb.—Prepared from protein of normal horse serum.

For a description of Food Allergens—Squibb. see New and Non-official Remedies, 1922, p. 241. E. R. Squibb and Sons, New York. (Jour. A. M. A., Jan. 27, 1923, p. 251).

PROPAGANDA FOR REFORM.

The Disappointments of Hexamethylenamin.—Hexamethylenamin has joined the large and growing group of drugs of which much has been expected but which have failed to justify the hopes of their champions. The use to which hexamethylenamin is still devoted with apparent scientific justification is in preventing the growth of micro-

organisms in the urinary tract and in destroying them when they are present in the urine in infectious diseases, such as typhoid fever. The drug is recommended as an antiseptic in cystitis and as a prophylactic prior to operations on the urinary tract.

Its possible efficacy, however, depends on the elimination through the kidneys with a urine that remains distinctly acid in reaction; otherwise, no benefit is to be expected. Hexamethylenamin has no material antiseptic value as an antiseptic in the cerebrospinal fluid during spinal meningitis. It is not a uric acid solvent. Finally, the drug has been shown to have no diuretic potency. Furthermore, hexamethylenamin is said to be liable to produce renal irritation when the dosage is large or the use protracted (Jour. A. M. A., Jan. 6, 1923, p. 37).

Present Status of Insulin.—The investigators of "Insulin"—the new pancreatic extract proposed for the treatment of diabetes—have applied for a patent on the product in Canada, United States and Great Britain. The patent for Canada and the United States has been tendered, when granted, to the University of Toronto. The University proposes to safeguard the product against commercial exploitation and to ensure the marketing of a standardized product. From the present indications it is hoped that the experimental period will be ended during the first half of 1923, so that the product will become available. Dr. McLeod believes that "Insulin" will never entirely replace careful dietary regulations, but that it is of undoubted value in assisting the weakened power to metabolize carbohydrates.

It is to be hoped that the University of Toronto will be able to control the advertising claims and methods of marketing of the product. (Jour. A. M. A., Jan. 6, 1923, p. 36).

Bacillus Acidophilus and Intestinal Putrefaction.—While the administration of soured milk products is at times beneficial, the cause of this beneficial action is still undetermined. The belief that the Bulgarian bacillus can be permanently implanted in the intestinal tract and that this implantation is responsible for the effects is no longer tenable. Of late attention has been called to the effects of the administration of milk cultures of bacillus acidophilus which is stated to be a normal inhabitant of the human intestinal tract.

It is reported that this bacillus may be successfully implanted in the intestinal tract provided a suitable pabulum is provided. It has been assumed that the acidity of putrefactive organisms would be almost entirely suppressed by a change of the flora produced by the administration of milk containing cultures of bacillus acidophilus and that with such implantation, the somewhat hypothetical toxic products charged with harm to the body might also be expected to be suppressed. If indican excretion, however, may be taken as an index of intestinal putrefaction, it now appears that implantation of bacillus acidophilus in the intestine does not lower the putrefactive process.

This suggests that favorable clinical effects produced by the administration of lactose cultures of bacillus acidophilus are not primarily dependent on decreased production of the antecedents of indican (Jour. A. M. A., Jan. 20, 1923, p. 186).

Book Announcements

Nutrition of Mother and Child. By C. ULYSSES MOORE, M. D., M. SC. (PED.). Instructor in Diseases of Children, University of Oregon, Medical School; Medical Director of the Co-operative Infant Welfare Society of Oregon, etc. Including **Menus and Recipes** by MRYTLE JOSEPHINE FERGUSON, B. S., B. S. in H. Ec. Professor of Nutrition, Iowa State College, Ames, Iowa. Philadelphia and London. J. B. Lippincott Company. One of series of Lippincott's Nursing Manuals. Cloth. 1923. 8vo. 234 pages with 33 ilustrations. Price $2.00.

Clinical Laboratory Methods. By RUSSELL LANDRAM HADEN, M. A., M. D., Associate Professor of Medicine, University of Kansas, School of Medicine, Kansas City, Kansas. Formerly Director of Laboratories, Henry Ford Hospital. Detroit. St. Louis. C. V. Mosby Company. 1923. Cloth. 8vo. 294 pages with 69 illustrations. 5 color plates. Price, $3.75.

Impotency, Sterility, and Artificial Impregnation. By FRANK P. DAVIS, Ph. B., M. D., Ex-Secretary Oklahoma State Board of Medical Examiners; Formerly Superintendent State Institution for Feeble-Minded; author of several books. Second Edition, revised and enlarged. St. Louis. C. V. Mosby Company. 1923. Cloth. 12 mo. 168 pages. Price, $2.25.

Navy Adopts Neoarsphenamine.

In accordance with suggestion made by Rear Admiral E. R. Stitt, M. C., U. S. Navy, neoarsphenamine, on account of the simplicity of its technic, has been substituted for arsphenamine on board ships and at stations and smaller hospitals. In the larger hospitals where facilities for the administration of arsphenamine are satisfactory, the choice between the two is left to the discretion of the commanding officer. It is stated that neoarsphenamine is used exclusively in the clinic of the Brady Institute, Baltimore, and Dr. Young and his associates are unable to note any lessened therapeutic efficiency with this drug than when arsphenamine is used.

Pamphlet on Child Labor.

In response to many requests for information regarding the present status of child labor in the United States, the U. S. Department of Labor, through the Children's Bureau, has just issued a brief pamphlet entitled "Child Labor in the United States: Ten Questions Answered." This may be obtained, free of charge, from the Children's Bureau, U. S. Department of Labor, Washington, D. C.

Treatment of Syphilis.

A revised copy of this pamphlet will be sent without cost to any physician addressing The Dermatological Research Laboratories, Philadelphia, or the Abbott Laboratories, Chicago.

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Editorial

Blood Sugar.

"Blood chemistry" is a term that recently has been given considerable prominence in medical literature. This term is generally accepted to mean the study of the metabolic substances circulating in the blood stream. One of the most important of the chemical substances is "blood sugar." The carbohydrates are converted into glucose in the intestines and, as glucose pass through the intestinal wall entering the portal blood. Glucose is stored in the liver as glycogen and is liberated into the blood stream as blood sugar to meet the demands of heat and energy in the body. The absorption of glucose from the carbohydrate meal takes place with varying degrees of rapidity and, therefore, it is subject to considerable variation in the blood during the course of its final distribution. The variations in the normal person after the administration of glucose for testing purposes is interesting. Fitz, as pointed out by Joslin, has emphasized this point. Following the ingestion of 100 grams of glucose, the blood of normal persons may vary in blood sugar, but it is felt that, should the blood sugar in such a case be more than 160 mgms. per 100 c.c. of blood within an hour, or 120 mgms. per 100 c.c. of blood within two hours, it is a condition justifying suspicion of diabetes.

But, by the present day tests, we are not prepared to place too great reliance in the sole examination of the blood sugar, for it is known that certain cases of hyperglycemia have shown little evidence of diabetes for many years. But, blood sugar studies are, nevertheless, of extreme importance and have given clinicians a considerable insight into the problem of dietary management of diabetes and will, no doubt, prove most important in the matter of the use of insulin,—the new product of the isle of Langerhans, discovered and now being experimentally used by the Toronto group and a corps of selected diabetic specialists throughout the country.

When the blood sugar exceeds 16% (160 mgms. per 100 c.c. of blood), sugar passes through the kidney-barrier into the urine. The margin of blood sugar concentration between 16% and 18% and above is very likely invariably to show a glycosuria. And, in the dietary management of diabetes, where blood sugar concentration is so often lapping over the margin of the normal, one has to remember the new findings as to the source of blood sugar. The carbohydrate tolerance now must include not only carbohydrates themselves, but a portion of protein 58%, and fats 10%, in diabetes, serve as a possible source of blood sugar. Sugar may appear in the urine in diabetes, when the blood sugar calculations are as low as .07% and not appear in blood concentrations as high as 0.5%, as Joslin has recently pointed out. But it must be remembered that in the use of fasting or other agents, the lowering of the blood sugar below .07% is dangerous and may bring on extremely grave symptoms in the patient. When the blood sugar values drop below this point, death impends. But it is reassuring to know that the serious condition can be quickly removed by the prompt administration of glucose by the mouth or under the skin.

One patient, in the hands of the writer, recently showed a blood sugar of 584 mgms. per 100 c.c. of blood; this was reduced within three days to 180 mgms. per 100 c.c. of blood, although the patient, an elderly diabetic with chronic nephritis, died of uremic coma.

Comments on Thyroid Diseases.

For a lucid and careful discussion of the diagnosis and treatment of the diseases of the thyroid gland, our readers are urged to read Walter M. Boothby's article, which is now appearing in Volume III, Oxford Loose-Leaf Medicine, beginning on page 883. Every practitioner and family physician should set apart at least a few hours to read this treatise on

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goiter. It possesses a clearness and modernness that is enlightening. Much of the work is based upon combined efforts and studies that have been in progress on this important clinical condition at the Mayo Clinic, as well as that culled from the studies of a large number of clinicians elsewhere.

The public propaganda and the interest of the laity in goiter require that the profession shall become thoroughly familiar with up-to-date knowledge on the subject. In making editorial comment, we have used this monograph as a guide and beg to call attention to Plummer's clinical classification of the thyroid diseases:—

1. Diffuse colloid goiter is characterized by the deposits of colloid in acini without symptoms of hyperthyroidism.

2. Adenomatous goiter, without causing constitutional symptoms, produces no alteration in the concentration of thyroxin in the body.

3. Adenomatous goiter with hyperthyroidism is a constitutional disease in which there is maintained an abnormally high and unregulated concentration of thyroxin in the body, producing increased basal metabolic rate and other secondary symptoms.

4. Exophthalmic goiter is a constitutional disease due to an excessive and possibly abnormal secretion from a parenchymatously enlarged thyroid with hyperplasia.

5. Myxedema.

6. Cretinism.

7. Childhood myxedema.

8. Thyroiditis.

9. Malignant diseases of the thyroid.

Colloid Thyroid.

The increase of thyroid gland by colloid enlargement throughout the country probably is due, it is thought, to the fact that there is a deficiency of available iodine in the body.

Diffuse colloid goiter is a symmetrical enlargement of the thyroid characterized pathologically by the deposit of an excess of colloid in the acini and clinically unassociated with signs or symptoms of hyperthyroidism. For this condition, a number of synonyms have been used; adolescent goiter, endemic goiter, simple goiter, the latter being the most common. The territorial distribution of endemic goiter is greatest in the northwest, Great Lake and upper Mississippi regions of this country, though it is found in fair degree of frequency elsewhere. Some states, as Idaho, which has reported 27 cases per 1,000 population, shows the greater incidence while 2 cases per 1,000 population is the ratio of incidence outside of the goiter regions. The deficiency of iodine, as before mentioned, is thought to be the cause of this type of goiter. Food stuffs lacking the iodine content may serve as the cause. The effort of the thyroid to produce thyroxin to meet physiologic requirements in the body without available and adequate iodine explains the deposit of colloid in an over-worked thyroid and gives the clinical enlargement.

This type of thyroid enlargement usually appears about puberty. While it is often the occasion of considerable alarm, both to young women patients and their over-anxious mothers, this type of enlargement may be confidently treated by the internist with assurance of success. These cases are attended by no general or constitutional symptom except such mental ones as are excited by the knowledge of having an enlargement of the gland. No hyperthyroidism or increased basal metabolic rate occurs. These are the cases where an honest statement of the nature of the goiter and its significance will do much to drive away such symptoms of pseudo-hyperthyroidism as may be exhibited. It becomes important in these days of publicity of medical diseases to make clear to patients the true nature of the malady. As to the enlargement of the thyroid in the young girl, an honest profession demands a frank and reassuring statement. The differential diagnosis may have to be made. In goiter, when the basal metabolic rate remains high after repeated readings and after rest in bed, one may be justified in classifying such a case in the hyperthyroid type which means exophthalmic goiter with attending symptoms of tremor, tachycardia, eye signs, nervous and mental symptoms.

Adenomata of Thyroid.

Adenomatous goiter without hyperthyroidism, is not unlike the colloid in its distribution and occurrence. It appears that in these cases there is a development of adenomatous

tissue. It is believed that this is a compensatory enlargement of acini of the gland that has been called upon to over-exert its function in the production of thyroxin on a limited amount of available iodine. Like the colloid type, this gland enlargement is not attended by constitutional disturbances which we know as hyperthyroidism. If the cases go on to advanced age, there may appear evidence of increased thyroxin output. After forty years of age, such symptoms do often appear.

This brings us to comment for a moment upon adenomatous goiter with hyperthyroidism. This is a constitutional disease due to an adenomatous enlargement of the thyroid which is maintaining an abnormally high output and unregulated amount of thyroxin. This causes an increased basal metabolism rate and other secondary symptoms which simulate toxic goiter of exophthalmic variety. But it is to the credit of Plummer that this type of goiter was shown to be different from exophthalmic goiter.

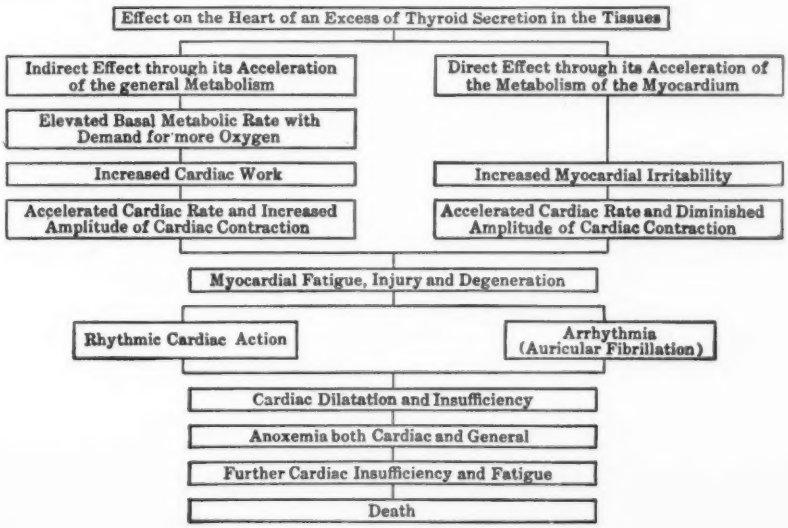
Exophthalmic Goiter.

The names Parry, Basedow, Moebius, Graves, are inseparably linked with exophthalmic goiter. But every enlargement of the thyroid is not a goiter and such a clinical fact must be now understood. "The etiology of exophthalmic goiter and adenomatous or colloid goiter is not a common one. The cause of exophthalmic goiter is as yet unknown, while the cause of colloid or adenomatous goiter is probably due to lack of iodine."

Pathologically, the finding is a diffuse parenchymatous hypertrophy. Plummer is quoted as saying that this is true in 99% of cases. Less than 1% of true exophthalmic goiter shows a mere diffuse colloid condition. These glands show a very low iodine content. The myocardium in 71% of a study of 1,244 consecutive autopsies by Wilson of the Mayo Clinic shows degenerative changes. The cervical sympathetic ganglia also show certain degenerative changes.

Symptomatically, the enlargement of the thyroid gland, the increase of metabolic rate, increased cardiac action, enlargement of the heart, increased appetite, with a loss of weight and strength, the marked evidence of nervous hyperactivity, with definite tremor, bilateral exophthalmus, and, finally, gastro-intestinal crises, stand out in the clinical picture of a case with exophthalmic goiter. In a study of 1,036 patients with exophthalmic goiter, 82% were women. It occurs chiefly between the ages of 20 and 40 years, although it is seen in patients of 49 years and above 50 years. The onset is usually quite sudden and it may appear after some intense nervous or emotional state.

We reproduce an interesting and impressive diagram, recently published in Oxford Medicine, which shows the effect upon the heart.


Effect on the Heart of an Excess of Thyroid Secretion in the Tissues
Indirect Effect through its Acceleration of the general Metabolism
Direct Effect through its Acceleration of the Metabolism of the Myocardium
Elevated Basal Metabolic Rate with Demand for more Oxygen
Increased Cardiac Work
Increased Myocardial Irritability
Accelerated Cardiac Rate and Increased Amplitude of Cardiac Contraction
Accelerated Cardiac Rate and Diminished Amplitude of Cardiac Contraction
Myocardial Fatigue, Injury and Degeneration
Rhythmic Cardiac Action
Arrhythmia (Auricular Fibrillation)
Cardiac Dilatation and Insufficiency
Anoxemia both Cardiac and General
Further Cardiac Insufficiency and Fatigue
Death

Good Roads! Goad Roads!! Good Roads!!!

Our readers are entreated not to grow weary but rather to be stimulated to activity by the reiteration of this title, Good Roads! Good Roads!! Good Roads!!! No group of Virginians is more vitally interested in the development of good roads through this Commonwealth than doctors. The problem of good roads' development is a medical one which deeply and crucially affects the doctor himself, his family, his community, his State.

The doctor himself! For many a weary hour has the doctor, whether in the city or country, battled with "Distance." Getting from one place to another, from one patient to another, transporting himself from one sick-bed to another, is one of the biggest jobs in the doctor's life. The doctor cannot deputize an agent to go for him; he must go himhimself. He must travel if he is to serve. He not only must travel, but he must do it ordinarily with reasonable amount of speed, because the element of time enters largely into the type of service he is rendering the public. Often times, it is a vital thing: it bears directly upon the issue of life or death; it enters daily into the surcease from pain and human suffering. It certainly plays an essential part in the doing of one's medical calls in the daily routine. A day's work among the sick, that may be done in a reasonable time, leaving for one's self a fair portion for rest and refreshment, is a day's work devoid of the wear and tear on the body and spirit of the doctor himself. The need for transportation of the doctor himself, with reasonable time, under reasonably favorable conditions, is absolutely dependent upon the maintenance of good roads.

The time element involved in the ease and promptness of calling upon the sick over good roads is one of untold value to the doctor himself. He can, by aid of good roads, travel more quickly, see his patient earlier and oftener. He can, over good roads, see a larger number and cover a wider territory and return home less fatigued.

Doctor, for Heaven's sake, fight for good roads for the sake of the doctor himself!

The Doctor's family: What does ease of transportation over good roads mean to the family of the physician? The family of the physician in rural and country life in Virginia deserves every advantage of ease of travel to or from home. The wife of the country doctor is really too much enslaved to the post of unremitting service by the very nature of her husband's vocation. She is entitled to receive at the hands of the State, in these times of automobile transportation, good roads that are serviceable all the year round. By this, she may at times at her pleasure enjoy the comforts of a motor trip about her neighborhood, to her church, or to some nearby city where she may find pleasure and refreshment. The same is true of the doctor's children. The young school children of the physician are a real part of the good roads' problem . Their physical development is a part of the good roads' development of Virginia. Good roads may save them from danger of some serious malady by enabling the ready visitation of a neighboring physician. Good roads may enable them to attend schools manned by teachers of ability and training. Good roads may afford them opportunity to attend more easily and readily divine worship and keep in close touch with the beneficent influences of the church.

Doctor, fight for good roads for the family's sake!

The doctor's community needs good roads. No one knows this better than the doctor. He knows that the very advantages that will come to himself personally and to his family by the establishment of permanent highways throughout this State will come to every citizen and family of his community. The health, the cultural, the intellectual and religious values of every community are interlinked with good roads in no little degree. The community which the doctor serves professionally is financially affected considerably by the matter of good roads' transportation. It is axiomatic and elementary, but it seems necessary again to affirm that by this means the markets are brought nearer to the farm, that the overhead expense of conveyance of farm products to the centers of population is directly connected with the question of good roads for automobile use.

The doctors of this State should make good roads a matter of state-pride. When one looks at the plans of neighboring states, one is almost ashamed to think that the advantages of good roads soon to be enjoyed by doctors of these states are to be longer denied Virginia doctors. The physicians of Vir-

ginia, whether from the seaside or mountain country, should stand out for good roads. They should preach and urge it wherever they go; in every home and at every fireside they should teach the need of good roads for Virginia. The doctors of Virginia are men all too broad to be provincial in the matter of fearing that one section of the State will fare better than another in the development of good roads, for they know, taking the matter in its broadest sense, that whatever benefits Virginians in Southside Virginia will also benefit Virginians in the Valley and in Southwest Virginia.

News Notes

Federal Department of Health, Education and Welfare.

An editorial on this subject appeared in the February issue of the *Kentucky State Medical Journal*, and tells of a conference held in Washington in January, at the office of General Sawyer. To this were invited representatives of the medical and health professions from all sections of the country. Dr. McCormack, who attended, gives such a full account of the meeting that we present some of the salient features of his editorial:

"General Sawyer, personal representative of the President, stated that it was the present purpose of the committee on reorganization of the Federal departments, to recommend to the Congress the establishment of a Department of Education, Health and Welfare, with a secretary in the cabinet, and an assistant secretary." This Department should consist of four bureaus—education, health, welfare, and the veterans' bureau. It was further proposed to transfer to the new Department all existing activities of the federal government along these several lines, taking over their personnel and functions, and putting them where they can work in harmony. All the other great governments of the world have already done this. It is not the purpose of the new Department to enlarge the federal functions nor to interfere with the full and free exercise of the police powers of the states in these respects. The aim is to simplify and concentrate federal bureaus, thereby increasing the efficiency of every bureau involved and decreasing expense.

This is a subject which has been agitated for many years and has the approval of the present administration. There could be no better time than the present for having it brought up in Congress.

The Tri-State Medical Association of the Carolinas and Virginia

Held its annual meeting at High Point, N. C., February 21 and 22, Dr. S. S. Gale, of Roanoke, Va., presiding. There were approximately 200 members in attendance. A number of interesting papers were read, including those in three symposia on mental diseases, cancer and pneumonia. The social features were enjoyable as usual. Greenville, S. C., was selected as the 1924 place of meeting and the following officers were elected: President, Dr. Chas. O'H. Laughinghouse, Greenville, N. C.; vice-presidents, Drs. D. A. Stanton, High Point, N. C., W. Lowndes Peple, Richmond, Va., and S. B. Sherard, Gaffney, S. C.; secretary-treasurer, Dr. James K. Hall, Richmond (re-elected). The new members elected to the Executive Council are Drs. Fred M. Hodges, Richmond; D. A. Stanton, High Point; and Wm. Robt. Wallace, Chester, S. C. Members of the Council holding over are Drs. J. T. McKinney, Roanoke, Va.; C. O'H. Laughinghouse, Greenville, N. C.; D. L. Smith, Spartanburg, S. C.; F. C. Rinker, Norfolk, Va.; John W. Long, Greensboro, N. C.; George H. Bunch, Columbia, S. C.

The Virginia Society of Oto-Laryngology and Ophthalmology

Will hold its next meeting in Richmond, April 18. Besides a symposium on Refraction and a number of papers by members, four invited guests will present the following papers: Sugar Tolerance in Lens Opacities, by Dr. H. M. Langdon, Philadelphia; Eye Conditions Resulting from Accessory Sinus Infection, by Dr. Walter E. Lambert, New York City; Brain Abscess, by Dr. Wells P. Eagleton, Newark, N. J.; Differential Diagnosis of Labyrinthine and Intracranial Lesions, by Dr. Lewis Fisher, Philadelphia.

Specialists throughout the State who are not members are urged to join. Application blanks may be obtained from the secretary, Dr. E. U. Wallerstein, 114 North Fifth Street, Richmond, Va.

Roanoke Doctors Active for State Meeting.

Roanoke doctors are planning and hoping for the largest meeting in the history of the

Medical Society of Virginia. Immediately following the Norfolk meeting, the Roanoke Academy of Medicine begun to make its plans in an active way and selected committees to take charge of the various activities, with Dr. John O. Boyd as president and Dr. Alfred P. Jones secretary of the General Committee. A full list of the committees and their members was given in our February issue.

Chairmen of the committees are holding regular monthly meetings at luncheon and propose to continue this until the meeting of the Society. The hotels give assurance that they will satisfactorily and comfortably care for the large attendance anticipated. The scientific meeting and exhibits have been arranged for at Hotel Roanoke. Tentative plans include a golf tournament, at a time which will not conflict with scientific meetings, and automobile rides into the lovely country around Roanoke.

Following the plan inaugurated at the Norfolk meeting, the chairman of the Ladies' Entertainment Committee is organizing her subcommittees and will arrange an attractive program to be announced later.

What About the "Super-Nurse"

Is a problem that is at this time being agitated in Michigan. It seems that the Rockefeller Foundation, through the recommendation of its nursing committee, has offered a million dollar endowment to the University of Michigan to have a department of nursing. This would be as separate and distinct a department as the departments of medicine or law and promises to turn out the "super-nurse," one who would be a separate and distinct entity from both the regular graduate nurse and the doctor, and one who would ultimately supplant both the doctor and the practically trained nurse. One journal expresses the idea that the "super-nurse" is "to tell the people when they need medical aid and then call on the doctor for it."

Will Michigan "fall" for the bait offered in this endowment fund?

Ethical Publicity on the part of the Profession.

Dr. J. E. Rush, field director for the American Society for the Control of Cancer, has written a paper in which he emphasizes this need for "ethical publicity on the part of the profession" in enlightening the laity as to the control of cancer. The physician is looked upon as an advisor in health matters, which may affect his clientele. Why not have occasional public meetings of your local societies to inform the layman as to health matters and, among other truths impress the slogan of the American Society for the Control of Cancer—"Early cancer is curable if you will but consult your medical practitioner in time"? Many appreciative patients will be found among those who are saved from untold suffering and perhaps early death, through early advice and proper instruction.

Coue's Visit.

Now that Emile Coue, the druggist of France, has paid America his long heralded visit and returned to his home, his work here may be likened to the sentiment expressed in the verse, "You sieze the flower, its bloom is shed." To those with whom he came in contact he gave the impression of sincerity and earnestness. He waived all claims to being a healer but combined faith and auto-suggestion as the fundamental principles of his cult—if it may so be termed. No doubt, both of these principles would be immensely helpful in many cases, but the great harm from following them blindly would be that many "Coue-ists" would too long defer the evil day for such diseases as might be readily alleviated or entirely corrected if taken in their incipiency.

The U. S. Naval Medical Bulletin,

For December, 1922, is of unusual interest. It gives a report of the International Congress of Military Surgeons and Pharmacists held in Brussels during the summer of 1921. This Congress was for the purpose of summing up practical experiences of the World War in medicine and surgery. In response to the invitation of the King of Belgium, over thirty nations, either allied or associated in the late conflict, or neutral, were represented at the Congress. The *Naval Medical Bulletin* gives an outline of the proceedings of the delegates to the Congress, a digest of the papers presented, and conclusions drawn from the discussions.

So successful was this Congress that it was planned to have another, which will meet in Rome in May, 1923.

Dr. W. B. Richardson,

Recently of Richmond, has located at Arvonia, Va., where he is doing general practice.

Chiropractic Dispensary Closed.

The State Board of Charities of New York City have been upheld by the Attorney General of the State in their recent action compelling the closing of a dispensary opened by chiropractors. This is the second defeat chiropractors have suffered in New York, their first being failure to secure legislation legalizing them in New York. The defeat of this object was greatly aided by Dr. Royal S. Copeland, then Commissioner of Health, but who is now sitting in the U. S. Senate.

Dr. F. E. Booker,

Halifax, Va., was a recent visitor in Raleigh, N. C.

Dr. A. W. Terrell,

Lynchburg, Va., has been spending a vacation in Florida.

The South Carolina Medical Association

Will hold its Seventy-fifth Anniversary Home-Coming meeting in the city of Charleston, April 17th, 18th and 19th, 1923, under the presidency of Dr. C. F. Williams, of Columbia.

It is desired to get in touch with every South Carolina doctor living outside of the State, and every graduate of the Medical College of the State of South Carolina.

Communications may be addressed to Dr. E. A. Hines, Secretary of the South Carolina Medical Association, Seneca, S. C.

Dr. J. Mettauer Williams,

Recently of Rocky Mount, Va., announces his removal to 601 Grandin Road, Roanoke, Va.

Col. William L. Keller, M. C.,

Director of the Surgical Service of Walter Reed General Hospital, Washington, delivered a lecture on "Empyema" before the senior students of the Medical College of Virginia, on March 3. Col. Keller is an alumnus of this college, having graduated there in 1899.

Intensive Campaign Against Tuberculosis.

Dr. W. Nelson Mercer, who is in charge of ...erculosis work of the Richmond Bureau of ...lth, assisted by Drs. H. R. Edwards and ...an B. Cole, has been holding day and night ...nics and giving a course of instruction in diagnosis of pulmonary tuberculosis to the colored physicians of Richmond. This course includes seven periods of one hour each, per week, at the City Tuberculosis Clinic. The demonstrations are practical, patients being brought in from the city sanatoria for actual demonstration and examination by the physicians. The government film on diagnosis of tuberculosis, issued by the Surgeon General of the U. S. Public Health Service, was shown on March 2nd to all colored physicians of Richmond, and they expressed their appreciation of its value by a rising vote of thanks. In addition to the clinics and instruction in diagnosis, several speakers have addressed various colored congregations and organizations throughout the city, to impress upon the people in general the value of early recognition and treatment of pulmonary tuberculosis.

During the month of March, the activities of the campaign are being devoted principally to the colored population of the city. The remainder of the ten weeks' campaign will be given jointly to white and colored.

Dr. William A. Downes,

Of New York City, by invitation, read a paper before the Richmond Surgical Society on March the 6th.

Dr. Stuart McGuire

Was among the speakers at the reunion dinner of the Richmond Chapter of Phi Kappa Sigma Fraternity on the evening of February 26.

The Medical Society of the State of North Carolina

Is to hold its annual meeting at Asheville, April 17, 18 and 19, under the presidency of Dr. John Wesley Long, of Greensboro. Dr. L. B. McBrayer, Sanatorium, is secretary of the Society.

Members of Health Board.

Drs. R. L. Gibbon, Charlotte, and Edgar H. Hand, Pineville, have been appointed members of the Board of Health of Mecklenburg County, N. C.

W. & L. Alumni Officers.

At the annual meeting of the Richmond chapter, Washington and Lee University Alumni, February 22, Dr. J. Morrison Hutcheson was elected president, and Dr. A. A. Houser, a member of the executive committee.

Radium Donated Hospital.

It has been announced through Dr. T. C. Redfern, medical superintendent of City

XUM

Memorial Hospital, Winston-Salem, N. C., that a donation has been made to the hospital of a sufficient quantity of radium for use in all cases to which it is applicable in treatment.

Dr. H. U. Stephenson,

Formerly of Toano, Va., but recently of Richmond, has tendered his resignation as a member of the board of governors of the State hospitals.

Honored for Work With X-Rays.

Dr. Charles Vaillant, of the Lariboisiere Hospital, Paris, was on February 19, awarded the Cravate of the Legion of Honor, the Carnegie Hero Medal, and the gold medal of the City of Paris—all rare honors. Dr. Vaillant was one of the first French doctors to apply himself exclusively to the study of roentgen rays, and, as a result of his experimentations, has lost his right arm to the shoulder and the left nearly to the elbow.

Dr. J. C. Bodow,

Hopewell, Va., has been appointed by Governor Trinkle as a member of the Prince George County Board of Health.

Doctors on Chamber of Commerce Committees.

At the annual meeting of the Board of Directors of the Richmond Chamber of Commerce, the last of February, the following local doctors were appointed members of committees for the ensuing year: Drs. J. Shelton Horsley, W. H. Parker, Charles R. Robins and Clifton M. Miller.

Dr. Harry E. Knox,

Formerly of Newport News, Va., has moved to Philadelphia, in which city he is continuing the practice of medicine.

Dr. G. W. Brown,

Superintendent of the Eastern State Hospital, Williamsburg, Va., was a recent visitor in Richmond.

Dr. Douglas D. Martin,

Upon completion of service as an assistant surgeon in the U. S. Navy, located in Tampa, Fla., in 1921, where he is now practising and limiting his work to diseases of children. He graduated from the former University College of Medicine, Richmond, in 1913, at which time he was appointed as one of the internes at Memorial Hospital, this city.

Prof. Roentgen Dead.

The death was announced February 10th, of Professor Wilhelm Konrad Roentgen, discoverer of Roentgen, or as he modesty called them, X-rays. He was nearly 78 years of age, having been born March 27, 1845, at Lennep, near the Ruhr district. After serving as professor of physics at various German universities, he went to Wurzburg, where in 1895 he made the discovery for which his name is chiefly renowned. He retired from teaching at the age of 75, his last post being the chair of experimental physics at Munich. He received the Nobel prize in 1900. His body was cremated.

The Clinical Society of Genito-Urinary Surgeons,

At their annual meeting held recently in Chicago, elected Dr. E. L. Keyes, Jr., New York City, president, Dr. Hugh H. Young, Baltimore, vice-president, and re-elected Dr. William C. Quinby, Boston, secretary-treasurer.

Wise County Jail Clinic.

The board of supervisors of Wise County, Virginia, has made appropriation for a jail clinic for treating delinquent prisoners affected with social diseases. Only two other jails in the State are reported to have such clinics, these being in Richmond and Norfolk. Dr. W. R. Culbertson, Coeburn, is in charge of health work in Wise County and co-operates closely with the State Health Department in all matters affecting the health of that community.

Dr. George G. Crawford,

Strasburg, Va., of the class '01, University of Virginia, Medical School, in addition to his skill as physician, has recently demonstrated his ability in a literary way. In response to an announcement from the University of Virginia Alumni Association, of the launching of a song contest, he submitted a poem which received the prize.

Attend Educational Meetings.

Dr. Manfred Call, dean of the Medical School of the Medical College of Virginia, and Dr. Theodore Hough, dean of the Medical School of the University of Virginia, were among those attending the Association of American Medical Colleges and the Council on Medical Education of the American Medical Association, at Ann Arbor, Mich., early this month.

Lt. Summers Transferred from Richmond.

Lt. Toson O. Summers, M. C., has been transferred by the U. S. Navy Department from duty at the navy recruiting station in Richmond, to duty in connection with the fitting out of the United States ship Richmond, to which he is assigned when the ship is commissioned.

Dr. W. B. Carr

Has returned to his home in Warrenton, Va., after a short stay in Washington, D. C. and New York.

Base Hospital 45 Holds Reunion.

Base Hospital No. 45, Veterans' Association, better known in this section as "The McGuire Unit," held its third annual reunion in Richmond February 28. Dr. W. Lowndes Peple was toastmaster at the dinner, which was followed by a business session. Among the speakers at this meeting were Drs. R. C. Fravel, F. M. Hodges, P. V. Anderson and Greer Baughman.

Piedmont Sanatorium to Have Children's Pavilion.

A meeting of the Piedmont Sanatorium committee, of which Dr. William F. Drewry, of Petersburg, is chairman, was held at the offices of the State Department of Health in Richmond, the middle of February, and contract was awarded for the building of a children's pavilion at Piedmont Sanatorium, as provided for by the last session of the legislature. An appropriation of $20,000 was made for this addition. Work will be commenced in a short time. Piedmont Sanatorium is the State Institution which cares for colored tuberculous patients and is located at Burkeville, Va.

The Virginia Conference of Social Work

Will hold a three day's meeting in Charlottesville, beginning April 22. Lewis Brownlow, city manager of Petersburg, is president. An interesting program has been arranged, which will include several noted speakers from a distance.

Blue Ridge Sanatorium to Have New Buildings.

Work will shortly be started on four new buildings at Blue Ridge Sanatorium, located near Charlottesville, Va. This is the newest of the State's tuberculosis sanatoria and is ideally situated in the foot hills of the Blue Ridge Mountains.

Dr. U. G. Jones,

Johnson City, Tenn., announces the opening of Jones Eye, Ear, Nose and Throat Hospital in Preas Building, on West Market Street. This will be thoroughly modern and will have a charity ward and also a free clinic each Monday and Friday from 1 to 2 P. M. Dr. Jones is a member of the Medical Society of Virginia, having formerly lived at Marion, Va.

Dr. H. Aulick Burke,

Upon completing his term of service as a medical officer in the U. S. Navy, located in Monroe, N. C.

Dr. Carroll Edward Foley,

Recently of Lovettsville, Va., announces the opening of his offices at 1720 M Street, Northwest, Washington, D. C. He will limit his practice to diseases of the eye, ear, nose and throat.

Dr. I. H. Goldman,

Of Richmond, a first lieutenant in the Officers' Reserve corps, has been assigned to the medical personnel of the 318th Infantry, Eightieth Division.

Officers of Westmoreland Club.

Dr. Beverley R. Tucker has been re-elected vice-president of Westmoreland Club, Richmond, for another year, and Dr. J. McCaw Tompkins has been named one of the new members of the board of governors.

Dr. L. O. Vaughan,

Waverly, Va., was among the doctors who attended the meeting of the Grand Lodge of A. F. & A. M., in Richmond, early in February.

Bequest to Johns Hopkins University.

Announcement was recently made through the *Baltimore American* of a bequest of $5,000,000 to Johns Hopkins University by the Carnegie Foundation of New York. It was stated that one of the aims of the gift was the erection of a seven-story building, which will combine a modern dispensary and other features as a unit of the Hopkins medical group.

Dr. and Mrs. Giles Cook,

Of Front Royal, Va., have been recent visitors in Richmond.

Dr. W. E. Fahrney,

Timberville, Va., was hurt in an automobile accident recently when rushing to his ill child. He regained consciousness after a short time

and apparently suffered little from the accident.

Are You Going to the California A. M. A. Meeting?

If so, why not write Dr. W. E. Musgrave, at Convention Headquarters, 808 Balboa Building, San Francisco, and secure information about the various trips which may be taken from San Francisco? His committee will answer any inquiry about any subject. A number of attractive trips to last from a few days to several weeks, have been planned. One of the trips suggested for those from the Eastern part of the United States is through Panama Canal by boat. Motor trips in single cars or small parties would also form a pleasant way of travelling for those who can spare the time.

The dates of the meeting are June 25 to 29. Extend your vacation time to see some of the many points of interest in the West.

Building at Johns Hopkins.

The new building for the school of hygiene and public health of Johns Hopkins University is in course of construction and is to cost $1,000,000. Work on construction of other medical buildings is also progressing well.

Charlotte, N. C., Has Orthopedic Clinic.

In conjunction with the work of the Health Department, an orthopedic clinic has been opened in Charlotte, N. C. It is in charge of Dr. Alonzo H. Myers, who gives his services gratis.

Dr. and Mrs. Thos. P. West,

Bedford, Va., have returned home after spending some time in Florida.

Dr. P. M. Chichester,

For some time medical inspector for the Richmond Bureau of Health, resigned this position to accept a commission with the State Department of Health, effective March 1. He will have charge of health work in Loudoun County, Virginia, under the auspices of the State Department of Health, and will be stationed at Leesburg.

Dr. A. M. Showalter,

Cambria, Va., attended the annual meeting of the Grand Lodge of A. F. and A. M., in Richmond, in February, and visited several places in the eastern section of the State before returning home.

Danville Plans New General Hospital.

With the bequest of $250,000 left the Danville, Va., General Hospital, by the will of the late John E. Hughes, it is planned to erect a new building. It is likely that the present hospital will be sold and a new site selected for a thoroughly modern and up-to-date institution in some other part of the town.

Dr. E. C. Levy,

Director of Public Welfare, Richmond, returned the latter part of February from New York City, where he attended a meeting of the executive committee of the American Public Health Association, of which Association he is president.

Fire at New York Hospital for Insane.

On February 18, one of the buildings of the Manhattan State Hospital for Insane, Ward's Island, New York, was destroyed by fire, and twenty-four inmates and three male attendants lost their lives. The building destroyed housed seventy-five of the most violent patients—those with homicidal tendency—and great praise is due the attendants for their excellent work in rescuing the number of patients.

Married.

The marriage has just been announced of Dr. Thomas Dewey Davis, Richmond, Va., and Miss Willie Evelyn Owens, Marion, S. C.

Dr. Robert Minor Baker,

Of the class of '18, Medical College of Virginia, is located and practising in Jacksonville, Fla.

National Negro Health Week

Will be celebrated this year from April 1 to 7. As a result of better health and housing conditions among the negroes, their death rate has been materially decreased, especially in the Southern states. These figures indicate that the American negro is not necessarily short lived nor especially liable to disease. Interested organizations are urged to get in touch especially with those negroes who have not yet learned of the benefits to be derived from an adherence to the laws of health and hygiene.

Dr. G. B. Dudley, Jr.,

Who has been in Danville, Va., for the past four years, associated with Dr. T. W. Edmunds in eye, ear, nose and throat practice, left the first of March for New York, where he expected to attend clinics and get equip-

ment for his new office, which he expects to open in Burch Building, Martinsville, Va., the 1st of April. Dr. Dudley will limit his work in Martinsville to the same specialty.

National Hospital Day

Will be celebrated again this year on May 12. Suggestions for programs and other information may be secured from the secretary, Matthew O. Foley, 537 South Dearborn Street, Chicago.

Dr. Charles R. Woolwine,

Davy, W. Va., is this year's president of the McDowell County (W. Va.) Medical Society. Dr. Woolwine is a member of the '08 class, Medical College of Virginia.

Are You Reporting Births in Your Practice?

A preliminary summary of births in Virginia for the year 1922, showed 5,298 less than in 1921. Delayed reports may reduce this number somewhat, but there will still be a decline from previous years. Doctor, in justice to the child in future years, will you please see that all births in your practice are recorded promptly?

Bulletin on Vitamins.

A new bulletin on Vitamins may be obtained by addressing the U. S. Department of Agriculture, Washington, D. C. Although meat had been assigned a rather low value as a source of vitamins, experiments made by the U. S. Department of Agriculture show that various kinds of lean meat and the edible organs of cattle, sheep and hogs have been found to contain varying quantities of vitamin B, also known as the antineuritic vitamin. Certain of the internal organs, particularly the heart, liver and kidney, are relatively rich in the three vitamins A, B and C. The lean meat of pork contains a much larger proportion of Vitamin B than beef. Those interested in vitamins will wish to see the bulletin.

Wanted.

A physician to locate in a very promising community. Address P. O. Box 141, Millboro, Va.—(Adv.)

Wanted Drug Clerk.

Young man for a small town drug store, operated by a doctor. Rare opportunity for a hustler with some drug store experience. No cash necessary, but would prefer small investment in the business and, if satisfactory relations, could take over the management. Address "Hustler," care Virginia Medical Monthly.—(Adv.)

Obituary

Dr. Tunis C. Quick,

Surgeon in the U. S. Public Health Service, but formerly of Falls Church, Va., died suddenly February 20, while on a visit at the home of his sister at Falls Church. Dr. Quick was born in Loudoun County, Va., 52 years ago and studied medicine at Columbian (now George Washington) University, Washington, from which he graduated in 1895. He joined the Medical Society of Virginia in 1901 and took an active interest in its work, being elected one of the vice-presidents in 1905 and serving as a councilor from 1908 to 1910. Dr. Quick entered the medical reserve corps of the army at the beginning of the World War, with the rank of lieutenant colonel and, upon completion of this service, entered the U. S. Public Health Service. He was a Knight Templar and was an enthusiastic member of numerous medical and fraternal organizations. Following services at the Baptich church in Falls Church, the body was carried to Arlington where interment was made with full military honors. The services there were conducted by the Army chaplain, the Legion chaplain and the Masons. Dr. Quick is survived by his wife.

Dr. Walter Were Rangeley,

Of Christiansburg, Va., died at his home in that place March 4. He was born at Stuart, Va., 55 years ago and studied medicine at the University of Maryland, Baltimore, from which he graduated in 1896. He had been a member of the Medical Society of Virginia since 1901 and was one of the prominent doctors of that section. Dr. Rangeley was for fifteen years a member of the Montgomery County Board of Health. He is survived by his wife and three children.

Dr. Fenton M. Nichols,

A prominent physician of Loudoun County, died at his home at Purcellville, Va., February 17, after a short illness with pneumonia. He was a native of Loudoun County and was sixty-two years of age. He graduated in medicine from the former New York University, Medical College, in 1885. Dr. Nichols was a member of the local and State medical societies. His wife survives him.

XUM

Dr. James M. Raby,

One of the leading physicians of Isle of Wight County, died February 28, at his home in Windsor, Va. He was about 60 years of age and graduated from the University of Louisville, Medical Department, in 1885. He was prominently identified with the business and professional interests of his community and was one of the founders and, at the time of his death, president of Farmers' Bank of Windsor. Dr. Raby had been a member of the Medical Society of Virginia for a number of years. His wife survives him.

Resolutions on Death of Dr. Roy.

The following was adopted at a meeting of the Richmond Academy of Medicine and Surgery, held on the 13th ultimo:

Dr. James P. Roy, a practising physician and a member of the Richmond Academy of Medicine and Surgery, died at his home in this city on January 25, 1923, at the age of 61 years.

He was born in Fort Leavenworth, Kansas, and was the son of Colonel James P. Roy and his wife, Mrs. Kate L. Bridges Roy, both being members of old Virginia families. At twelve years of age, he came to Richmond to enter McGuire's school, and, later, he attended Pampatike Academy, in King William County, Va., where he graduated in 1880, distinguishing himself by standing the first in his class. In the same year he entered the University of Virginia and graduated with high honors in senior Latin, French, mathematics, history, literature, physics and chemistry, and in 1884 received his M. D. degree. The next two years were spent in the Emergency Hospital of Washington, D. C., where he gained a wide experience. In 1886, he located in Richmond for the practice of his profession. He became connected with the Medical College of Virginia and taught and demonstrated anatomy, and, later, taught orthopedic surgery in the same institution. In addition to being a member of this organization, he was a member of the Medical Society of Virginia and of the American Medical Association.

Dr. Roy always manifested a deep interest in his chosen profession, was of a modest and unassuming disposition, always courteous and gentle in his manner, and endeared himself to a large clientele. He leaves to mourn him, his wife, Mrs. Beulah Meyer Roy.

The Richmond Academy of Medicine and Surgery hereby expresses its appreciation of his qualities as a man and physician, and directs that this sketch be placed in the minutes, that a copy be sent his wife, and that it be published in the VIRGINIA MEDICAL MONTHLY.

(Signed)
CHAS. R. ROBINS,
MANFRED CALL,
CLIFTON M. MILLER.

Dr. Charles Elliott Stafford.

We were only recently notified of the death on June 24, 1922, of Dr. C. E. Stafford of Eggleston, Va. He was operated on about four years ago for gall-stones and had apparently been in better health until the day prior to his death. He was about 70 years of age and graduated from the former College of Physicians and Surgeons, Baltimore, in 1875.

Dr. John R. Couch,

Richmond, Va., died at his home in this city, March 2. He was a native of Oxford, N. C., and fifty-four years of age. He studied medicine in Baltimore, after which he located in Lunenburg County, Va., where he practiced until he moved to Richmond, about two years ago. He was a member of the Medical Society of Virginia. He is survived by his wife and ten children.

Dr. James J. Wingard,

Of Lexington, S. C., died December 4, at the age of 58 years. He was a graduate of the Medical School of the University of Virginia in 1895.

Dr. Orville Nalle,

Elkwood Va., died February 18, after a short illness from a stroke of paralysis, which came as a climax to a period of ill health dating back for more than a year. Dr. Nalle graduated in medicine from the University of Virginia in 1884, and was formerly a member of the Medical Society of Virginia. He is survived by his wife and several children.

Dr. Marvin Le Roy Smoot

Died at his home in Fayetteville, N. C., Febraury 6, after a long illness. He was forty-six years of age and graduated from the former University College of Medicine, Richmond, in 1903. He was one of the prominent eye, ear nose and throat specialists of North Carolina.

Dr. John Robert Lee Hardesty

Died February 5, at the home of his son in Washington, D. C. He was born in Harrisonburg, Va., 87 years ago, and graduated in medicine from Jefferson Medical College, Philadelphia, in 1856. He was active in the Confederate service during the war between the States, and later practiced in Virginia until 1885, when he moved to Washington and specialized in diseases of the ear and throat until his retirement on account of age.

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